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### DIESEL RAILWAY TRACTION

*A Supplement illustrating and describing developments in Diesel Railway Traction is presented with every copy of this week's issue*

### The Language of Scientific Evidence

EXPRESSING the opinion that the community was now on the threshold of vast new developments in its structure, Lord Stamp, speaking at the dinner of the Society of Incorporated Accountants and Auditors in London on October 21, said that the accountant would be called upon to play an important part in these developments, for scientific progress could show itself in industry today only through the verdict of the cost accountant and by his language. Accountancy, said Lord Stamp, as the language of scientific evidence, was only in its infancy. This is an important statement from such an authority, for with the ever-increasing application of machinery to all phases of industry, and the consequent inevitable reduction in the amount of human labour required for a given output, accountancy as the language of scientific evidence becomes more urgently necessary. As we have suggested more than once before, accountancy should measure true cost, and not merely monetary cost. True cost is that which is consumed in production. Thus, to take a very elementary example, the cost of a field of corn is the seed which has been sown, together with the human or mechanical energy dissipated in the preparation of the field, the sowing, and

the tending. Accountancy, if it is truly to reflect realities and become the language of scientific evidence, must get down to realities such as these.

\* \* \* \*

### "From Washington to Munich"

In the issue of *The Economist* for October 22, the Editor of that journal, Sir Walter Layton, whose resignation is announced, addresses a farewell message to his readers. Under the significant heading "From Washington to Munich" he recalls the great and rapid changes in world affairs during the seventeen years of his editorship; from the Washington Conference, at a time of high hopes for a world peace and disarmament, to the agreement of Munich and the hair's breadth escape from a world war. It has been a period of great advances in civilisation and new amenities have been brought within the reach of the people. Transport has been completely reorganised, both on road and rail, and capital and labour have been reconciled. Sir Walter Layton refers to the many occasions in the past when *The Economist* pointed out the inevitable consequence of the policy pursued by European nations, forecasting with certain prescience the march of recent events. The rise to power of National Socialism in Germany and the later Berlin-Rome agreement, were foreseen in 1930, and in 1931 the desirability of a German-Austrian reunion. Unfortunately high tariff walls and the complexities of international finance continue to form obstacles to good relations, but there is now the hope that the natural instinct of mankind to save itself from destruction, and the unquenchable vitality of the human spirit will break the shackles that confine it in so many countries of the world.

\* \* \* \*

### The Week's Traffics

For the past week the Southern, alone among the four main line railway companies, shows an increase in comparison with the corresponding week in 1937, following an advance in the previous week. Passenger train traffics in the past week show a net decrease of £14,000, and coal has a net increase of £2,500, but merchandise is down £157,500. In the 41st week the net decrease was £184,000.

	42nd Week				Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	%
L.M.S.R. ..	4,000	73,000	1,000	78,000	2,103,000	-3.91
L.N.E.R. ..	8,000	54,000	2,000	64,000	1,621,000	-4.14
G.W.R. ..	3,000	25,000	2,000	30,000	874,000	-3.87
S.R. ..	1,000	5,500	5,500	1,000	156,000	-0.92

In the following table the comparisons are with the corresponding week in 1936:—

	42nd Week				Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	%
L.M.S.R. ..	25,000	48,000	23,000	—	138,000	+0.31
L.N.E.R. ..	3,000	34,000	19,000	12,000	219,000	+0.59
G.W.R. ..	9,000	12,000	9,000	6,000	327,000	+1.53
S.R. ..	8,000	4,500	2,500	6,000	605,000	+3.51

Passenger train traffics in the 42 weeks of 1938 are £2,458,000 better than those for the corresponding period of 1936, and coal class receipts are up £874,500, but general merchandise earnings are down £2,023,500.

\* \* \* \*

### Assam Railways & Trading Co. Ltd.

Improved results both from its railways and from general trading were secured by this company in the financial year ended March 31, 1938. It possesses in the north-east of Assam metre gauge lines of 112½ miles, a 2-ft. colliery line of 29½ miles, and collieries, sawmills, brickworks, and motorbuses. Holdings in the Rivers Steam Navigation Co. Ltd. and in two tea companies also form part of its assets. Railway earnings in the year

under review rose from £133,287 to £149,152, working expenses were reduced from £88,693 to £82,688, and the profit on working was £66,464, against £44,594 for the previous year. The amount of coal sold increased from 197,830 tons to 218,623 tons, and coal earnings from £38,427 to £52,434. Profit from general trading amounted to £49,743, compared with £34,375 in 1936-37, and the net amount received in dividends and interest on investments improved from £10,229 to £14,449. After paying debenture and note interest and the usual dividends on the pre-preference 8 per cent. A shares and on the new 6 per cent. preference shares, and transferring £10,000 to reserve for renewals and depreciation, there is a balance of £82,998. This enables a dividend of 4 per cent. to be paid on the £630,000 of cumulative 8 per cent. A stock, absorbing £25,200, and £47,798 to be carried forward after further allocations of £10,000 to various reserves, &c.

\* \* \*

### The Transportation Association of America

The first reports of the Transportation Association of America, reviewed in our columns this week, announce the plans of the association for the preservation of private enterprise in all forms of transport. This ambitious programme is to take the shape of a national policy, formed with the collaboration of all privately-owned transport interests, and counting on the support of the agricultural and industrial users of transport. The national policy thus formed by these somewhat heterogeneous groups, is to be presented to the legislative and administrative authorities, and the first step has now been taken in the shape of the publication of a mass of statistics and informative data. The financial position of railway enterprise in the United States has reached a stage where it would seem that, failing some extraordinary revival in trade, drastic measures may be required. It is not clear what form the national policy of the association is to take or if it precludes intervention by the State. If it succeeds, against all prospects, in uniting the conflicting interests of rival transport organisations, this may open up an entirely new avenue of approach to a solution of the present railway problem, which no one is likely to welcome more than the companies and the Government.

\* \* \*

### A North Union Centenary

October 21, 1838, marked a further stage in the development of the first main line to the North, as it was on this day that the North Union Railway was formally opened between Wigan and Preston. The earlier section of the undertaking (Parkside to Wigan) had been built by a company called the Wigan Branch Railway, which was incorporated in 1830 and opened its line on September 3, 1832. The Liverpool & Manchester Railway agreed to work it, and the terms of this arrangement constitute the first railway working agreement. As soon as the Wigan scheme was launched, the cotton spinners of Preston realised the importance of being linked with the South Lancashire railway system, and secured the incorporation in 1831 of the Preston & Wigan Railway. This company was unable to raise enough funds to carry out the work and eventually joined forces with the Wigan Branch Railway. The Royal Assent was given on May 22, 1834, to a Bill forming the North Union Railway to take over the interests of the two concerns; this was the first railway amalgamation ever sanctioned by Parliament. Under the North Union auspices the Wigan—Preston section was put in hand early in 1835, and opened 100 years ago, five weeks after the completion of through railway communication between South Lancashire and London.

### A Premium on Punctuality

That there were railways in the past—and in the far-distant past—that realised the virtues of punctuality is recalled by the centenary of the North Union Railway, which effected a junction at Parkside with the Liverpool & Manchester Railways. At Parkside junction the arrangement between the North Union and the Liverpool & Manchester was that each company should be fined 20s. for every minute that one of its connecting trains was late, a healthy stimulus to punctual operation being provided in this way. The only recent parallel so far as we know has been in the United States, where passengers by extra-fare trains—the extra fare being based on the advantage in journey time over other trains—have been entitled to a refund of one dollar for every hour that these expresses have been behind time. But as in America it is the recognised business of drivers to make up lost time, whether lost in circumstances under their own control or not, the chances of any passenger being in a position to claim this refund have been slender. The fine time-keeping record of France is assisted by the bonus offered to drivers recovering lost time, and supports the contention that stimulus of some description is desirable if punctuality standards are to reach the highest level.

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### The B.A.G.S. Meeting

The unanimous acceptance of the Buenos Ayres Great Southern Railway report and accounts for 1937-38 was frankly declared by the Chairman, Sir Follett Holt, to be a surprise to him. It will be seen from our report of the proceedings at the meeting on page 743 that damage to crops by frost, and the loss of the carriage of one million tons of higher-rated grain, caused total traffic receipts to fall by £112,000. As far as ton-mileage is concerned, the business lost was more than made up for in other directions, but as this involved the haulage of less remunerative commodities, the net result was that the railway did more work for less pay. Yet expenditure on rolling stock and motive power has been unavoidable, and the company is placing in service 24 new steam and diesel locomotives and 77 passenger railcars. The Chairman expressed his conviction, and it went undisputed, that even in present conditions the policy of meeting public requirements and road competition by the improvement of train services is the right one. Regarding prospects of nationalisation, there was no dissentient to the Chairman's opinion that the situation of Argentina being wholly indebted to foreign resources for its main lines of transport could not go on for ever.

\* \* \*

### How Copenhagen Tunnel Got its Name

Mr. William Whitelaw was presented recently with an interesting etching dated 1783 of Copenhagen House, which gave its name to one of the tunnels at the approach to King's Cross station, L.N.E.R. The picture now hangs in the headquarter offices at King's Cross and Mr. Frederick Sinclair, the St. Pancras Borough Librarian, has compiled some notes on the history of Copenhagen Fields and House. His researches show that Copenhagen fields were the site of a public house opened by a Dane about the time when the King of Denmark visited his brother-in-law, King James I. In Camden's map, 1695, it is called "Coopen Hagen." After the Restoration it became a tea house, and was much frequented for its amusements and for its views of the surrounding scenery. Soon after the Lord George Gordon riots, 1780, the house was enlarged and became famous for fives playing, mention of which is made in the writings of Hazlitt. In 1816, the landlord had his licence refused for encouraging

dog-fighting and bull-baiting. In the early days of the French Revolution the fields near Copenhagen House were the meeting place of the London Corresponding Society, which was the cause of some alarm to the Government of the day. Copenhagen House occupied the site now covered by the cattle market off Caledonian Road.

\* \* \* \*

### The District Line Collision

A summary of Lt.-Colonel Woodhouse's report on the Charing Cross (District Line) collision, the conclusions of which were outlined in our issue of September 23, appears on page 739. The case has been so much referred to already that little further can be said. The confusion that arose between the words "on" and "off" is understandable, for they are dangerously similar when shouted across a station, maybe with other sounds interfering, just as the old "larboard" and "starboard" were so easily confused at sea. That a serious message should be, as Colonel Woodhouse well expresses it, garbled by a porter entrusted with sending it is, however, inexcusable. The story of the delay in dealing with the motormen's warnings makes far from agreeable reading, but the feeling that the signalling was so good that a dangerous failure was practically impossible, which has naturally grown up in the course of years of irreproachable working, may perhaps have contributed to the hesitation in realising how serious a defect existed. Nevertheless, there had been a false clear signal on the Northern tube line only nine weeks before and this should have made the station staff all the more ready to act with strict care and promptitude when it was heard that something, whatever it might be, was wrong. The need of an effective tail signal, instantly recognisable as such, is stressed in the report, and is something we have long been urging, for if, by any chance, a train is wrongly admitted to an occupied section this is the last defence against an accident, and it should be a reliable defence.

\* \* \* \*

### Prizes for Track Maintenance 100 Years Ago

On page 719 we reproduce the notice of a scheme of prizes for the best kept permanent way lengths which was exhibited at the recent exhibition in connection with the Centenary of the London & Birmingham Railway at Euston. It is dated December, 1838, which shows that from the very outset the authorities of the London & Birmingham Railway were alive to the importance of encouraging their employees to do their best. The prizes were substantial considering the value of money in those days. The points which were to determine the award were: "The rails being in perfect line, level and gauge; ballast being neatly and regularly trimmed, both on the top and at the sides; the ditches being kept clean, and at the proper inclination; the slopes properly drained and trimmed; the quick fence well weeded, the ditch clean, and the post and rail fence in good order; the roads over the railway level so as to prevent water soaking through the arches; the general state of repair from the time of the notice until the premiums were awarded." Finally, the condition was stated that "any improprieties of conduct towards the police, drunkenness, or neglect in using the red flag, will also be taken into account." This reference to the red flag is interesting 100 years later.

\* \* \* \*

### Double-Wire Signal Equipment in Australia

On page 722 we publish some particulars of the modified double-wire signal, point, and detector mechanisms introduced as a result of practical experience on the Victorian Government Railways, and due to Mr.

F. W. Harvey, Assistant Engineer of the Signal Division. They will, we are sure, be of interest to some of our overseas readers who have adopted the double-wire system of transmission for certain installations and have themselves been led to consider the question of design in the light of experience and the requirements arising from the adaptation of this method of working to the English form of non-trailable points. As is well known, double-wire working is standard practice in several Continental countries, but divergent views are held there on certain points of detail, some engineers even going so far, for instance, as to consider that the risk of wire breakage with anything like reasonable maintenance may be practically ignored. Others, however, go to the opposite extreme and provide against every conceivable contingency, although it complicates the equipment to do so. As there is now quite an amount of double-wire working in the British Empire, it is to be hoped that others using it will publish the results of their experience in due course.

\* \* \* \*

### Historic Note on Welding

Sir William J. Larke, in his inaugural address as President of the Institute of Welding, made an interesting reference to the early history of welding which, as he said, was both the oldest method of affecting the union of metals by means of forging, and the newest method in view of the recent developments in the application of electricity and gas to the process. He mentioned a welded copper drain pipe 4.7 cm. in diameter 1.4 mm. thick found in Egypt under conditions that indicated its date as about 2750 B.C. The development from forge fusion welding passed through the stages of brazing and soldering, still much used, but because the metals are united by alloys having a lower melting point than the parent metal, the weld has a much lower resistance to shock and stress than the parent metal itself. Consequently quite early in history the union of metal by overlapping and riveting was adopted, with its advantage of applicability *in situ* and in any position. It has taken thousands of years to overcome the difficulties in the way of applying sufficient heat locally to make welding a practical constructional method.

\* \* \* \*

### Standard-gauge Wagons on Metre-Gauge Trucks

On a number of occasions we have referred to the methods adopted on various Continental lines for transporting standard-gauge wagons over narrower-gauge tracks by loading them upon special trucks, and in connection with the recent Jubilee celebrations of the Brünig Railway (which we recorded in our issue of June 17 last, pages 1174 and 1181) we remarked on the success which that undertaking has achieved in this direction. The administration owns 38 special trucks for carrying standard-gauge wagons, and since 1916 these have been in constant use all the year round. There are two loading places, one at Lucerne and the other at Interlaken East, where the standard-gauge line is arranged to abut on the level against the rails of the Brünig metre-gauge track. The latter is held in position by its own brakes and by a link and pin as well. These trucks are worked on the adhesion lines only, and not on the rack section, and they are hauled at speeds up to 31 m.p.h. The idea of conveying standard-gauge wagons on road vehicles of somewhat similar design to the Brünig metre-gauge rail trucks has, of course, been adopted by the Reichsbahn and by the Italian State Railways. More recently the Swiss Federal Railways have obtained two road trucks built on the same principle, each capable of carrying a load of 32 metric tons, and mounted on 16 rubber-tyred wheels or rollers.



## London Transport Report

**T**HE fifth annual report and accounts of the London Passenger Transport Board covering the year ended June 30, 1938, has, like its predecessors, a handsome orange-red cover. It includes a map of the new works programme 1935-40, and a review of the work of the board during its first five years. During this period the aggregate expenditure by the board on additions and improvements to its undertaking and on replacements has amounted to £22,059,390, of which £12,313,957 related to the programme of new works embarked upon in 1935 by the board in conjunction with the main-line railway companies, with the support and co-operation of the Government. The London Electric Transport Finance Corporation Limited has issued £41,650,000 of 2½ per cent. debenture stock guaranteed by the Treasury which has yielded in cash £39,966,250. The board has undertaken to borrow up to 70 per cent. (or such other proportion as may be agreed) of this amount, and the London & North Eastern and the Great Western Railway Companies are to borrow the balance. The amounts borrowed are repayable between July 31, 1950, and July 31, 1955. In order to repay the sums borrowed by the board from the Finance Corporation additions will ultimately have to be made to the issues of the board's transport stocks. The new works programme 1935-40 will involve an expenditure estimated originally at about £40,000,000, but now, at some £45,000,000. The sums set aside to the renewal reserve out of the board's revenues during the five years amounted to £11,671,500, and the sums charged against the renewal reserve during the same period amounted to £1,853,003, leaving an accumulated balance at June 30, 1938, of £9,818,497.

The total number of passenger journeys originating upon the board's system during the financial year 1937-38 amounted to 3,723,655,768, or 87,262,158 more than in the previous year, when the strike of drivers and conductors employed on the Central buses resulted in the complete withdrawal from service of all the buses in the Central area from May 1 to 27, inclusive. Of these journeys 487,749,023 or 13 per cent. were by railway, 2,167,309,552 or 58 per cent. by buses and coaches, 700,932,969 or 19 per cent. by trams, and 367,664,224 or 10 per cent. by trolleybuses. In the year 1936-37 the percentages were 14 by railway, 55 by buses and coaches, 25 by trams, and 6 by trolleybuses. The total number of passengers covered by the pooling scheme of the board and the main-line railway companies amounted to 4,317,979,132, an increase of 86,815,588 passengers as compared with the previous year when, however, the total pool traffic was reduced as a result of the Central bus strike. Receipts from passengers under the pooling scheme are shown in the accompanying table:—

	1937-38 £	1936-37 £
Passenger receipts originating on—		
Railways (L.P.T.B., G.W.R., L.M.S.R., L.N.E.R., S.R., and Joint Lines) ..	19,512,895	19,629,815
Buses and coaches (L.P.T.B.) ..	16,236,651	15,217,707
Trams (L.P.T.B.) ..	4,121,299	5,260,300
Trolleybuses (L.P.T.B.) ..	2,249,334	1,270,107
	<u>42,120,179</u>	<u>41,377,929</u>
Average receipt per passenger journey ..	2.341d.	2.347d.

The board's share of these receipts, after operation of the pooling scheme, amounted to £30,758,440 in 1937-38, against £30,077,161 in 1936-37, £29,532,879 in 1935-36, £28,823,262 in 1934-35, and £27,151,277 in 1933-34. To these sums have to be added goods traffic receipts of £113,527 and miscellaneous traffic receipts of £51,861.

General financial results of the board's operations are shown in the following table:—

	1937-38 £	1936-37 £
Capital expenditure .. .. .	131,281,061	123,777,419
Total traffic receipts .. .. .	30,923,828	30,247,378
Working expenses .. .. .	24,923,256	23,917,085
Provision for renewal .. .. .	2,425,000	2,400,000
Net traffic receipts .. .. .	3,575,572	3,930,293
Other receipts .. .. .	1,654,246	1,623,539
Miscellaneous charges .. .. .	35,216*	293,779
Net revenue .. .. .	5,265,034	5,260,053
Transfer from C stock interest fund ..	28,344	30,843
Interest on London Transport stocks other than C .. .. .	4,080,447	4,080,447
C stock interest .. .. .	1,027,952	1,092,199
Other appropriations .. .. .	184,979	118,250

\* After crediting £230,000 provisions for income tax in previous years not now required.

Interest paid on C stock was 4 per cent. for the year under review, against 4½ per cent. for the previous year. Among "other appropriations" in 1937-38 are included £26,202 to C stock interest fund, £136,549 interest, &c. to the London Electric Transport Finance Corporation Limited, and £8,246 in respect of guarantee of interest on Central London (new) guaranteed assented stock. The operating ratio for 1937-38 (excluding provision for renewal) was 76.4 per cent. against 76 per cent. in the preceding year.

During the year a number of minor negotiations with the trade unions for improved rates of pay and conditions of service of the staff has been completed. The most noteworthy change has been in adjustments made in favour of the lowest paid members of the staff, the cost of which in a full year is estimated at £52,000. There was a general increase in the cost of commodities and supplies during the year. The cost of fuel for buses and coaches has increased as a result of higher prices and the cost of electric current for railways, trams, and trolleybuses is greater as the result of increases in the price of coal. Again, the prices paid for supplies of cloth for issue as uniforms were higher on the average by some 10 to 15 per cent. There was, on the other hand a reduction in tyre costs. Salaries and wages absorbed £16,704,937, or 67 per cent. of the working expenses of £24,923,256. The passenger service car mileage operated by the board during the year amounted to 567,029,870.

When the programmes of new works and improvements now in hand have been completed, the board, since its establishment in 1933, will have added 17 miles of new railway with 11 new stations to its system of railways and will have rebuilt 45 of its existing stations. Connections will have been made with the suburban systems of the London & North Eastern Railway at Stratford, Newbury Park, Finsbury Park, and Highgate, and with the Great Western Railway at North Acton, and the board's trains will have been projected over 49 miles of railway owned by these two companies. By the end of 1940 such places as Ruislip and Denham in the west, High Barnet, Finchley, and Alexandra Palace in the north, and Ongar, Woodford, Newbury Park, and Leyton in the east and north east, will be provided with electric services running to and from the heart of London. Suburban stations on the Metropolitan Line will have direct access to the west end by through services of Bakerloo Line trains. The Edgware branch of the Northern Line will have been extended to Bushey Heath (Aldenhurst). On the Metropolitan Line the main tunnelling work between Baker Street and Finchley Road has been completed, including the new escalator tunnels at Swiss Cottage and Acacia Road stations. It is hoped to project Bakerloo Line trains to Stanmore in the autumn of 1939. On the Central Line considerable progress has been made with the installation of the current rails on the existing



L.N.E.R. Loughton and Grange Hill branch lines over which the board's trains will operate. About 30 track miles were completed at June 30 last.

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### Czechoslovak Railways in 1937

THE annual report of the Czechoslovak State Railways for the year 1937, which has just been published by the Ministry of Railways in Prague, is of peculiar interest in view of the recent events, and particularly as it will be the last yearly report to deal with the railway system in its present form and as it has been developed since the constitution of the Republic in 1918. The railway system of Czechoslovakia was briefly described in THE RAILWAY GAZETTE of September 30 last, when we also published a map of the system, with sketch maps of some of the frontier arrangements. It will be recalled that the Czechoslovak State Railways were formerly part of the old Austro-Hungarian system, and the development of some of the main routes of communication to meet the changed national requirements has given rise to the interesting results, described in our article of September 30. It is more than probable that fresh adjustments will now be made in the railway system to meet not only frontier arrangements, but also the changes that will develop in the agricultural and industrial relations with the capital. The total length of the railways owned and worked by the State in 1937 was 7,146 miles, and adding 1,260 miles of private lines worked by the States, the total length operated by the Government was 8,406 miles. There were also 180 miles of private or foreign-owned lines. Of the total of 8,586 miles, 8,324 are standard gauge and 262 miles of narrow gauge. Only 27 km. (17 miles) of new lines were added in 1937. The report now published gives the following results of working the railways for the year 1937, the figures being in millions of crowns\* :—

	1937	1938
Gross earnings .. .. .	4,308	3,576
Expenditure .. .. .	4,229	3,977
Working profit .. .. .	80	—
Working deficit .. .. .	—	401
Ratio of working per cent. ..	98.14	111.21

The national estimates for 1937 forecast a deficit of 585 millions of crowns, and that this estimate should have been converted into a surplus of 80 millions is an indication of the unexpected improvement in receipts, and indirectly, of the increased prosperity of the country generally, in 1937. The surplus is credited towards writing off the deficit of the years 1933-1935. In addition to the working expenditure there was a capital outlay of 571 million crowns under the investment budget, of which 237 millions were for construction of new railways and extensions, 95 for new locomotives, and 175 for new lines, with 54 millions for construction on private railways under State control. This investment expenditure has been covered by loans from the Treasury.

The increase of over 20 per cent. in gross earnings in the year under review was made up of improved receipts in both passengers and goods traffic. Passenger receipts were 907 million crowns, or 10 per cent. more than in 1936; luggage and express goods, 129 millions, were 15.3 per cent. more, and goods receipts reached a total of 2,848 millions, or 22.1 per cent. more. Moreover, 268.7 million passengers were carried, or 11.6 per cent. more than in 1936, and 72.5 million metric tons of goods were transported, an increase of 24.4 per cent. The total of passenger-km. was 36.3 per cent. greater, and goods

ton-km. 36.7 more, denoting a longer average journey and longer haul. In all some 5,860,859 wagons were loaded (799,496 more than in 1936), of which 462,683 contained export consignments (an increase of 125,904), and 1,438,939 were loaded with coal (an increase of 277,078). The Czechoslovak railway administration has had its own motor transport system since 1927, and in 1933 the railway authorities took over from the Post Office the great bulk of the motor services until then run by that department. Considerable use is made of railcars, and 500 of these vehicles are in service. The 1937 results, after several lean years, seemed to promise a turn in the fortunes of the national railways.

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### Central Argentine Railway

THE gross income of £9,315,262 for the year ended June 30, 1938, was the lowest since the war, and more than three-quarters of the decrease of £2,901,786 in comparison with 1936-37 resulted from the exceptional coincidence of acute shortages in each of the principal grain traffics. In receipts from maize alone there was a decrease of £1,489,376 or 56.7 per cent., caused by a fall of 60 per cent. in tonnage. Receipts from wheat were lower by £555,188 or 46.4 per cent., and from linseed by £172,519 or 48.6 per cent. There was a smaller quantity of maize remaining for transport after the heavy despatches of the previous year, which brought about a decline in earnings of £500,000 during the first half of the financial year. Then drought caused the loss of about a third of the wheat and half of the maize and linseed harvests, growers retained such small crops as there were of wheat and linseed, and maize movement was hindered by adverse weather conditions in the last quarter of the year. Livestock yielded £27,871, or 8.2 per cent., more. Passenger traffic was, on the whole, more encouraging, although there was a net decrease of £27,855 or 1.1 per cent. in receipts. As a result of unequalled suburban movement, the total number of passengers carried reached a peak figure. Suburban receipts were up £45,000, due to lower fares and improved services. Main line passenger travel was affected by the unfavourable agricultural situation and the increasing activities of road services, whose range of operation has extended with the completion of the 500 mile paved road from Buenos Aires to Cordoba. Movement of main line passengers differed only slightly on the whole from the preceding period, but receipts declined by £73,000 owing to a fall in first class traffic and an all-round extension of cheap excursion facilities. Some operating results are compared in the accompanying table :—

	1937-38	1936-37
Average miles open .. ..	3,700	3,700
Number of passengers .. ..	52,214,168	48,720,906
Passenger receipts .. .. .	£2,483,553	£2,511,408
Public goods traffic, tons ..	6,263,644	10,797,380
Public goods traffic, receipts ..	£5,233,916	£7,800,786
Average receipts per ton of goods ..	16s. 8½d.	14s. 5½d.
Public traffic train-miles ..	14,179,392	15,043,356
Net profit per train-mile ..	2s. 8½d.	5s. 0d.
Net profit per mile of line ..	£517 5s. 0½d.	£1,015 7s. 6½d.
Operating ratio, per cent. ..	79.45	69.25

It was impossible to restrict expenditure in any way like the same proportion as the abrupt fall in receipts, more especially in view of the economies already made in recent years. Heavy usage of rolling stock in 1936-37 entailed a large amount of repair work during the year under review. Cost of train working was seriously affected by the rise in the price of coal, which made a difference of £120,000, and basic rates of pay remained the same, as gross earnings were within the limits prescribed by the Presidential award. Salaries and wages accounted for

\* £ = 164.25 crowns at par, or 140 crowns at current rate of exchange.

£4,917,877, or 66 per cent. of the total expenses. Fuel was responsible for £709,131, or 10 per cent., and general materials, &c., for £1,774,423, or 24 per cent. Since the year 1926, of the total track mileage of 4,028, 563 miles have been relaid with 100 lb. rails, which, together with the use of 85 lb. rails over a further 395 track miles has increased the average rail weight per yard from 81.6 lb. to 86.2 lb. Of a route-mileage of 3,700, 904 miles are now laid on stone ballast, mainly from the company's quarries. Among the innovations of the year were the inauguration of the air-conditioned semi-Pullman train El Cordobes—the fastest long-distance train in regular operation in South America—on the Buenos Aires—Cordoba route, the intensification of one-class main line excursion services, and the introduction of diesel trains between Buenos Aires and outer urban districts.

### Buenos Ayres Western Railway

THE year ended June 30, 1938, was one of the worst in the history of this railway. Frost and drought between them practically wiped out both wheat and maize crops from which so large a proportion of the company's revenue is normally derived. At the same time the condition of the camps in the stricken areas made it necessary to come to the assistance of the farmer by means of rebates, so that heavier movements of cattle, hay, and seed yielded no financial advantage. Gross receipts declined by £395,603 or 10.59 per cent. and although there was a saving in working expenses of £80,891, or 2.72 per cent., net receipts were £314,712 lower, at £448,935. Exchange differences were £229,562, against £299,488, leaving a balance of £219,372, compared with £464,159 in 1936-37. Sundry credits, including the £29,561 brought forward, amounted to £240,324, which, with the addition of £100,000 transferred from reserve, covered the prior charges of £547,245, leaving £12,451 to be carried forward. Charges under the Midland Railway working agreement have risen from £70,401 to £92,472, but no allocation has been made to renewals funds, for which a provision of £49,072 was made out of net revenue account in the previous year.

Passenger traffic, however, remained remarkably buoyant. Thanks to the growing population of the western suburbs and the aid of cheaper fares and improved train services, local passengers showed an increase of 9 per cent. General passenger traffics also showed a small improvement, so that total passenger revenue increased by £50,052 or 6.15 per cent. Goods traffic declined by 427,298 tons or 19.53 per cent., bringing a decrease in revenue of £396,288 or 24.10 per cent. It was not possible to reduce expenditure *pari passu* with the decline in revenue. A wages cut of 5 per cent. was applied as from April 1, under the terms of the Presidential award of October, 1934. Maintenance expenditure both on way and works and rolling stock was reduced, but the cost of locomotive running increased by £41,631 or 5.6 per cent. because of the higher price of fuel. Some operating figures are compared in the accompanying table:—

	1937-38	1936-37
Passenger journeys .. .. .	23,585,057	21,690,952
Tons of goods .. .. .	1,761,045	2,188,343
Average goods haul, km. .. .	206.23	216.98
Train-kilometres .. .. .	9,084,328	9,085,784
Operating ratio, per cent. .. .	86.56	79.56
Passenger receipts .. .. .	864,566	814,514
Goods receipts .. .. .	1,248,204	1,644,492
Gross receipts .. .. .	3,340,028	3,735,632
Working expenses .. .. .	2,891,093	2,971,985
Net receipts .. .. .	448,935	763,647

Mileage of line worked throughout the year was 1,930, the same as in the previous year. The Armstrong-Whitworth diesel railcar, which has been running between Once

and Pehuajo, continues to give excellent service and its schedule now comprises a daily run of 726 km. Two smaller railcars which were put in service on December 15, 1936, have also done good work. Road competition continues to make itself felt, but the measures taken to combat it are meeting with success. The special rates put in force for stations within a radius of 270 km. from Buenos Aires, and the ever-increasing construction of roads have caused the road haulier to go further afield. To meet this new competition suitable railway rates are also being applied to embrace the greater distances over which the activities of road hauliers are extending.

\* \* \* \*

### Buenos Ayres & Pacific Railway

DUE to the small crop of fine cereals and maize, with the consequent influence on the sale of wine, revenue in the financial year ended June 30, 1938, receded to just under the level of 1935-36, and was lower by £756,955 or 10.47 per cent. than the revenue of 1936-37. In working expenses there was a saving of £385,011 or 7 per cent., leaving net receipts £371,944 lower, at £1,353,333. From this sum has to be deducted £670,549, as compared with £752,348, for loss on exchange, and the total amount available for debenture interest, &c., is £826,217, against £1,120,513. Full interest payments on the due dates have been made on the first debenture stocks of the company, the Argentine Great Western, and the Villa Maria & Rufino Railways, and on the Pacific and the Great Western second debenture stocks, making a total of £373,315. In addition, two payments each of one half-year's interest on account of arrears were made on December 1, 1937, and July 28, 1938, on Pacific 4½ per cent. consolidated debenture stock and on Great Western 5 per cent. debenture stock, so that payment of arrears on these stocks has been brought up to July 1, 1934, and October 1, 1934, respectively. The total debit balance is now £5,705,663.

Passenger numbers increased by 1,060,660 or 8.03 per cent. and passenger receipts by £33,996 or 4.03 per cent. The fast day services to and from Mendoza and San Juan were well patronised, and excursion trains are no longer necessary. Traffic on the Buenos Aires local section continued to expand and brought in an increase of £20,000. Railcar services and the combination with the underground railways at Retiro and Chacarita were factors contributing to these results. Parcels and excess luggage brought in £515,896, an improvement of £37,519 or 7.84 per cent. The quantity of cereals conveyed was only 960,514 tonnes, as against 1,962,292 in the previous year, and the receipts therefrom fell from £1,266,853 to £625,348. Wine traffic was 576,340 tonnes compared with 650,220 tonnes in 1936-37, with receipts of £1,706,851 against £1,945,516. Some comparative operating figures follow:—

	1937-38	1936-37
Passengers .. .. .	14,262,602	13,201,942
Tons of goods (metric) .. .	3,032,137	3,956,998
Train-miles .. .. .	9,344,227	9,603,449
Net profit per train-mile .. .	2s. 10½d.	3s. 7d.
Operating ratio, per cent. .. .	79.08	76.13
Passenger receipts .. .. .	877,506	843,510
Goods receipts .. .. .	4,478,415	5,260,350
Gross receipts .. .. .	6,469,595	7,226,550
Working expenses .. .. .	5,116,262	5,501,273
Net receipts .. .. .	1,353,333	1,725,277

Retentions in salaries and wages were applied during the last three months of the financial year. The lesser work performed—represented by less kilometrage run and fewer repairs to rolling stock in general—is well reflected in the working expenditure. The sum of £100,000 has been included in working expenses for the year as a further provision for deferred renewals.

## LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

### Tube Train Destination Indicators

London Passenger Transport Board,  
55, Broadway, S.W.1

October 20

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I read in THE RAILWAY GAZETTE for October 7 some criticism of the lack of indication of local trains and through Watford trains on the Bakerloo Line. In this connection you may be interested to know that, in conjunction with the New Works Programme, train destination indicators of the type in use on the Northern Line, which, as you know, show the first and second trains, will be provided at all northbound platforms of stations between the Elephant and Castle and Baker Street, inclusive. This provision will, of course, be the more necessary when the Bakerloo trains run, not only to Queen's Park, Harrow, and Watford, but also to Wembley Park and Stanmore. On the southbound line destination indicators will not be required, because there will be only one destination, the Elephant and Castle.

Yours faithfully,

E. RAWDON SMITH  
Public Relations Officer

Luton, October 11

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I have read with interest your recent leading article on the subject of platform indicators on the Bakerloo Line of London Transport. It occurs to me that your suggestion is somewhat premature, for surely indicators on the northbound platforms at stations from Elephant & Castle to Baker Street inclusive will become essential next year as soon as through working to Stanmore is inaugurated. Presumably indicators will then be provided in the normal course of events in accordance with London Transport practice on other lines.

What I do suggest, however, is that when these indicators are designed, wording should be arranged to appear thus: "When no through train is indicated, passengers for stations beyond Queens Park should board the first train to that station, and change there to an L.M.S.R. electric train." At stations from Marylebone to Kilburn Park inclusive, I suggest a permanent notice, thus: "Passengers for stations beyond Queens Park should board the first train and change at Queens Park to an L.M.S.R. electric train." This information is additionally useful as many of the through Bakerloo trains "pass" some of these stations. As a further indication, could not Watford and Harrow trains have window boards or roof-boards on the side, similar to the Ealing trains on the Central Line?

Yours, &c.,

"ELTEE"

### "The A.B.C. Railway Guide"

London, W.6, October 15

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Through the medium of your columns I should appreciate the opportunity of congratulating the new proprietors of our old friend "The A.B.C. Railway Guide" on the very legible type in which the current issue has been set. Another commendable point, which I did not see mentioned in the review in your September 30 issue, is that one table now usually suffices for a destination served by a number of routes. This has avoided that abomination known as "Another Route," sometimes recurring three or four times, involving the wading through of a number of tables and possibly the discovery that the last-given route happened to be the most convenient!

In spite of these improvements however the "A.B.C." is not yet, in my opinion, as useful a guide for the uninitiated traveller as it might be. For instance, the interavailability of monthly return tickets over alternative routes has not re-

ceived adequate attention. Another and a related point is that some of the alternative routes given are far too long and require such changes and lengthy waits as to make a through journey undesirable. Their chief value is of course that a journey can be broken at an intermediate point thereon. But it is no use cluttering up, for example, the Nottingham and Manchester tables with columns of figures giving a practically useless through service from King's Cross.

So long as a passenger knows such a route exists, then he can avail himself if he desires of the break of journey facilities at such towns as Peterborough and Grantham, but naturally if he wished to see what kind of train service these suggested places had, he would look under the correct headings in the "A.B.C." and discover the full service, and not turn up "Manchester" or "Nottingham." To put forward a suggestion, would it not be more helpful to follow up, under "Manchester" for example, with "monthly return tickets interavailable with full break-of-journey facilities in each direction via Euston, St. Pancras, Marylebone, and King's Cross. No through trains via King's Cross, passengers wishing to use this route for break of journey should look up the required point in the alphabetical columns"?

Another deficiency in the guide is that there is no means of distinguishing services by through train or through carriage from those where one or two changes are necessary. This point could be met simply by using two different kinds of type. For instance around the popular departure hour of 10 a.m. on weekdays, a service, marked "Restaurant Car" is offered from each of the three London termini of King's Cross, Marylebone, and St. Pancras, each of which deposit the passenger in the city of Sheffield within a few minutes of each other. To the unsuspecting traveller all that perhaps remains is to choose his London station. Actually, however, only one of these services is by through train, the others involve a change right in the middle of the crucial lunch time and a wait in most cheerless surroundings for a connection, which it is to be hoped may be punctual.

Two other points: the "A.B.C." now forms a very useful hotel guide, but as the advertisements are now all placed together, a proper index would be of assistance; and, finally, the railway map provided is just about as comprehensible as a Chinese puzzle. The recent correspondence in your columns under the heading "Timetables" should give some idea of what is wanted here.

Yours faithfully,

VITESSE

### The Berlin-Potsdam Railway Centenary

London, October 15

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In reading the various published accounts about the recent centenary celebrations of the Berlin—Potsdam railway I notice the same discrepancy that has appeared elsewhere before, as to whether the first section, opened on September 22, 1838, was between Berlin and Zehlendorf, or Zehlendorf and Potsdam. In some cases the contradiction appears in the same article or book, a table of dates stating one thing and the heading of an illustration the other. Have you any information which would enable the facts to be established?

T. S. LASCELLES

[We referred the above question to Dr. Sommer, Chief of the Press Service, of the German Ministry of Transport, who has kindly replied as follows: "We have ourselves already noticed the contradictory statements concerning the opening of the first section of the Berlin—Potsdam Railway, which have probably arisen from the use of inaccurate sources of reference. The facts are that the first section was from Zehlendorf to Potsdam, opened on September 22, 1838, and the line was opened throughout on October 29 following."—ED. R.G.]



## PUBLICATIONS RECEIVED

**South West Borderland of Shropshire.** Official Guide. Shrewsbury: Wilding & Son Ltd., Castle Street. 8½ in. × 5½ in. 128 pp. Folding map. Illustrated. Paper covers. Price 1s. net.—"South West Borderland of Shropshire," which has just been published for the first time, comprises the sole official guides to Bishop's Castle, Clun, Knighton, Craven Arms, and other sleepy and homely little places which lie on the borderland of Wales between Church Stretton, Montgomery, and Ludlow—a district which A. E. Housman called "a country for easy livers, the quietest under the sun." Besides giving a wealth of information for everyday needs, the guide delves deeply into the past and among things dead and gone it has not failed to refer at some length to the fate of the old Bishop's Castle Railway. This was a hard-up, shabby, leisurely line which played hide-and-seek with the laws of finance for 75 years, only to be caught in the end. Quite a readable little history is given, illustrated with a photograph of the tough 68-year-old locomotive *Carlisle*, which survived to the end.

**A National Transportation Program.** Chicago, Illinois: Transport Association of America, 400, West Madison Street. Vols. I and II and Supplement No. 1.—These are the first of a series of brochures elucidating the programme of the Transport Association of America. A foreword explains that the purpose of the association, which is a non-partisan membership corporation, is to study private enterprise, in comparison with other economic principles, and to promote measures aimed towards its improvement, protection, and perpetuation. The plan of operation is based on scientific research, and the three brochures now published are the first results of nearly three years' of intensive study. The sub-titles of the three pamphlets sufficiently indicate their contents. Volume I is headed, "Recommendations and Conclusions"; Volume II, "History of Regulation and Brief Outline of the Transportation Problem, upon which the Recommendations and Conclusions in Volume I are Based"; and the Supplement, "A Review of Experiences under Monopoly and the Principles of Unrestrained, and Enforced, Competition in Transportation." The supplement contains a very comprehensive history of transport in the U.S.A., from early days 160 years ago, through the stages of monopoly, unrestrained competition, regulated competition and regulation, to the latest experiments of co-ordination. Volume II gives the statistical data upon which the recommendations and conclusions are based. This collection of statistics is very comprehensive and contains a series of comparative tables and statements which it would probably be hard to find elsewhere in such a convenient form. The figures refer not only

to railways, but also, in a "Summary of the Position of the Various Forms of Transportation," to matters relating to roads, waterways, and airways. The question of the U.S.A. railways is so vast and complex that any simple or single remedy for present ills would appear hardly possible, but the first step in the search for the solution of a problem should be to marshal all the known facts relating to it, and the Transportation Association of America has certainly achieved something towards it with the publication of these very comprehensive reports.

**Die Neuen Gedanken in der Deutschen Verkehrspolitik** (New Thoughts Manifested in the National Transport Policy of Germany). By Gustav Koenigs. Leipzig: Felix Meiner Verlag. 9½ in. × 6½ in. 27 pp. Price RM. 1 net.—This lecture, delivered before the Leipzig Institute of Transport, forms a concise summary of the policy being pursued by the National Socialist regime in Germany—a policy which should satisfy the strongest advocate of State control in such matters. Even in the pre-war days of the individual States, government ownership and management of the railways had become general, and voices were heard advocating a common national German railway system. This object was not attained until after the war, when the Reichsbahn, as it had been named, was involved for a time in the payment of reparations. The present publication reviews the development of events since the National Socialist party came into power in 1933, and gives sufficient details of previous history to enable the trend of policy to be understood fully. The enormous encouragement given to the motor industry, the construction of the new motor roads, the grants for research and the close supervision of all sorts of motor services are a distinguishing feature of the present Government's action. The old particularism has been swept away in favour of the one conception of organising everything for the national welfare and securing the complete authority of the Reich in every detail of organisation and action.

As, however, a considerable amount of transport work must be done substantially through private hands, every effort is made to co-ordinate their activities and direct them to the best general advantage, especially in the case of lorry, and river and canal barge services, and all forms of goods storage and transfer work. In the case of passenger services and tourist facilities special means are taken to prevent inefficient service and ensure that the user gets full value for his fare or any other payment. The lecture, which is a very informative one, treats the questions of the abolition of the international river commissions, established by the Versailles Treaty, at some length

and gives particulars of the various associations that have been formed to manage the business side of the various classes of transport and study the economics of the subject. The making of private profit, throughout identified with "liberalistic capitalist" theories, described as finally outworn, is declared to have been put aside, the object of all transport undertakings now being to give the community as many facilities as it can wish in the spirit of the words "The common weal must come before private gain."

**Machine Tools.**—From H. W. Kearns & Co. Ltd., Broadheath, Manchester, we have received an excellently produced catalogue illustrating and describing the firm's Nos. 4 and 5 size patent universal surfacing, boring, milling, drilling, and tapping machines. These are described as Kearns Patent, and Standard. Both machines are universal, and in all essential features similar. They have lately been entirely redesigned to enable them to make the fullest use of the new cutting alloys. They have increased rigidity over the older designs, and an outstanding feature is the simplicity of control. The concluding pages of the catalogue show various types of Kearns machines actually in use, some of them being shown engaged on operation on locomotive details in railway shops.

**Steel Production.**—"E. S. C. and its Products" is the title of a new illustrated booklet published by the English Steel Corporation Limited, Vickers Works, Sheffield. It is explained that close upon £3,000,000 has been spent upon reconstruction and modernisation of the company's equipment, and the reader is introduced through the medium of several graphic pictures—including a folding-plate view in the machine shop—to the up-to-date processes of manufacture now in use. Numerous products are also shown, including such railway items as automatic couplers, bogie sideframes and bolsters, and 150 tons of laminated, helical, and volute springs. Many interesting details of the productive capacity and equipment of the various departments occur in the text.

**Industrial Heating by Gas.**—We have received from Keith Blackman Limited, 27, Farringdon Avenue, London, E.C.4, a catalogue of the Keith high- and low-pressure gas systems of industrial heating, applicable to a great number of engineering and other processes. A patent injector is used, having the mixing or venturi tube of pressed steel, so as to ensure a smooth inner surface, accurately proportioned and always concentric with the jet or nipple. For the air-blast system, a development is now available of the well-known K.B. mixture control for automatically maintaining the proportions of air and gas, irrespective of changes in pressure of either. Tube, ring, and rotary-head burners are supplied for use with the Keith systems, also a platen type installation with longitudinal slot burners.

## THE SCRAP HEAP

"Is this the face that launched a thousand trips?"—Reflection of a tourist on seeing Thomas Cook asleep.

### TRAVEL CAUSES DIVORCE

Dr. William L. Leap, Professor of Sociology, Birmingham Southern College, Alabama, U.S.A., has expressed the theory that, because people travel more than in past years, there are more divorces nowadays. He says that as the result of travel, husbands and wives become dissatisfied with their partners. "Our grandfathers knew comparatively few outsiders, because they were forced to depend on horse-and-buggy methods of transportation," continued Professor Leap. "They remained maritally settled."

### DUNDEE & ARBROATH RAILWAY

This railway was opened from Arbroath to the temporary station at Craigie, near Dundee, on Saturday (October 6, 1838). The first train, consisting of 11 carriages, started from Craigie precisely at 12 o'clock and reached Arbroath at ten minutes to one o'clock, and, deducting a stop of five minutes to oil the axles, leaves the time of travelling precisely three-quarters of an hour, giving an average speed of 20 miles an hour.—From "The Glasgow Herald" of a hundred years ago.

### FIRST CLASS PASSENGER

At Mansion House Court the other day Alderman Sir George Truscott asked one, Louis Harris, of Westcliff-on-Sea, why he rode in a first class carriage on three occasions with a third class ticket. The reply, as reported in the *Daily Herald*, was as follows. "I am subject to attacks of illness," said Harris. "First class accommodation is a necessity to me. I admit I could afford to pay for it, but I have not felt justified in going to that extra expense." "Then I shall inflict upon you the full penalty on each summons and costs," said Sir George. "That will be £10 4s. in all."

"I want a ticket to York via London."

"Do you want a circular ticket?"

"I don't care what shape it is so long as I gets there."

From "Punch"

### PROBLEMS FOR THE P.O.

London Transport's correspondence has many examples of unintentional humour blossoming in the arid deserts of official phraseology. Hundreds of letters arrive every day from men who wish to become drivers and conductors of buses. The fact that they do arrive is a tribute to the knowledge and ingenuity of the Post Office. Some are addressed personally to the chairman, Lord Ashfield, and one reached

the board the other day addressed to "Lord Ashfield, Training Superintendent, Chiswick." Many letters are addressed personally to officials and, apparently on the principle of always calling a policeman "sergeant" and always calling a sergeant "inspector," a number are inscribed "Mr. —, Esq.," with perhaps the addition of a service rank.

"Mr. Bollane, Educational Officer," and "Mr. Ballowlean, Traffic Inspector, Chiswick," owe their existence to the fact that the address of the board's training school is Bollo Lane, Chiswick. In recent letters, this address has been twisted into: Blobo Lane, Poble Lane, Bowler Lane, Baw Law Lane, Balls Lane, Bowleys Lane, Barrow Lane, and Bolla Bridge Works. Perhaps the

most amusing distortion of all was "Blotto Lane." The date stamps on the letters show that the officials of the Post Office had guessed the first time what the writers meant. They were able even to read the minds of the writers who sent letters to "Brown's Yard, Polo Lane," or "Staff Manager, Chelsea Bus Garage, Chelsea."

The "Superintendent of Unemployment" is a non-existent person frequently addressed. The "Commissionaire of Labour" received an application. It would be interesting to know whether the writer had in mind a commissar or a commissioner. The training school was flattered recently by being addressed as "The College for Training Bus Conductors." One applicant explained, "I have recently got married, but now wish to better myself."

## LONDON & BIRMINGHAM RAILWAY.

ENGINEERING DEPARTMENT.  
Birmingham, December, 1838.

The Directors with the view of inducing the Overlookers, Foremen and Platelayers to use every exertion in getting the permanent way into perfect order will on the first of April next award the following Premiums.  
**THE RAILWAY WILL BE DIVIDED AS FOLLOWS.**

### FIRST.

From the 54th Mile Post to the 64th, and from the 79th to the 85th, being five Overlookers' Lengths.

### PREMIUMS.

For the Best Length - -	£5.	To the Overlooker.	£3.	To Each Foreman.	10s.	To each Platelayer.
Second - - - - -	£4.	"	£2.	"	9s.	"
Third - - - - -	£3.	"	£1 10s.	"	8s.	"
Fourth - - - - -	£2.	"	£1	"	7s.	"

### SECOND.

From the 64th Mile Post to the 79th Mile Post, being five Overlookers' Lengths.

### PREMIUMS.

For the Best Length - -	£4.	To the Overlooker.	£2.	To each Foreman.	9s.	to each Platelayer.
Second - - - - -	£3.	"	£1 10s.	"	8s.	"
Third - - - - -	£2.	"	£1.	"	7s.	"

### THIRD.

From the 85th Mile Post to the 112½, Birmingham Station, being five Overlookers' Lengths.

### PREMIUMS.

For the best Length - -	£4.	To the Overlooker.	£2.	To each Foreman.	9s.	to each Platelayer.
Second - - - - -	£3.	"	£1 10s.	"	8s.	"
Third - - - - -	£2.	"	£1.	"	7s.	"

In awarding the above Premiums it will be considered that no Foreman's Length shall be less than half a mile, and that no gang shall have more than three Platelayers, besides the Foreman.

The points which will determine the award are.

The Rails being in perfect line, level and gauge.

The Ballast being neatly and regularly trimmed, both on the top and at the sides.

The Ditches being kept clean, and at the proper inclination.

The Slopes properly drained and trimmed.

The Quick Fence well weeded, the Ditch clean, and the Post and Rail Fence in good order.

The Roads over the Railway level, so as to prevent water soaking through the Arches.

The general state of Repair from this time until the Premiums are awarded.

Any improprieties of conduct towards the Police, drunkenness, or neglect in using the Red Flag, will also be taken into account.

Notice issued by the Engineering Department of the London & Birmingham Railway in December, 1838, announcing the award of premiums for the best kept lengths of permanent way (See editorial note on page 713)

## OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

### INDIA

#### Railway Conference Postponed

The annual session of the Indian Railway Conference Association, which was to have opened at Simla on October 8, has been postponed till the end of November and will be held in Delhi.

The general managers of Class I railways were at Simla during the first week of October for the half-yearly conference with the Railway Board.

#### New P.W.I. Branch and Mr. Carpmal

At a well-attended meeting of permanent way men of all grades employed on the M. & S.M. and S.I. Railways held at the M. & S.M.R. offices at Madras, a resolution was unanimously adopted, requesting the Council of the Permanent Way Institution (England) to recognise the formation of a section in South India. The proposer of the resolution traced the growth of a feeling that more facilities for the technical education of the permanent way staff was desirable, to enable them to keep abreast of modern ideas and systems of work. The establishment of a local section of the Permanent Way Institution seemed to be the best means of meeting this desideratum. If the local section were formed, it was intended that meetings should be held at various centres where the staff could attend without having to travel long distances, and would take the form of a visit to or inspection of some work of interest, followed by a meeting at which a paper would be read and discussed. It was also suggested that such a branch would bring into intimate contact officers and men of both the railways to their mutual benefit.

Mr. R. Carpmal, Chief Engineer, Great Western Railway (England) and President of the Permanent Way Institution, who was in India as a member of the Pacific Locomotive Committee, was present at the meeting by special invitation. Addressing the gathering, Mr. Carpmal said that he felt himself singularly fortunate in being present at the formation of the local section. He emphasised the educational side of the institution's work, pointing out that the papers read before the local sections and published in the *Journal of the Institution* had the status of standard works on permanent way. There were, however, greater advantages to local members in the discussions that followed the reading of these papers, in which practical points were brought out and made available for the mutual good of all members of the local section.

Mr. Carpmal concluded by observing that the labours of the Pacific Locomotive Committee could have been considerably reduced, had the institution been able to publish a paper,

jointly written by a member in India and a member in England, on a comparative study of the permanent way in India and England.

After the provisional election of officers of the local section, the meeting closed with a vote of thanks to Mr. Carpmal.

#### Nizam's State Railway Excursion to Kashmir

An excursion tour was arranged by the Nizam's State Railway to Kashmir in August and September this year with en-route tours of Allahabad, Lucknow, Lahore, Peshawar, the Khyber Pass, Delhi, and Agra. The tour involved a journey of approximately 4,200 miles—or more than the direct distance from London to Karachi—and occupied a period of 23 days. It was run as a conducted tour, the Nizam's Railway, in co-operation with others, making all arrangements for transport by rail and road, sight-seeing, conductors, music, houseboats, horses, dandies (palanquins), &c., at special inclusive fares.

There were 74 second and 73 third class tourists on the train, all provided with sleeping accommodation. Special literature giving descriptive accounts of the many and varied places visited was specially compiled and copies handed to every passenger. Catering was arranged in a restaurant car attached to the train, and three types of food were provided for Hindu, Muslim, and English passengers respectively.

A feature on this train was the exhibition by the Commerce & Industries Department of the Nizam's Government of the many products of the State cottage industries, in one of the compartments specially fitted for the purpose. The variety of transport and accommodation to be arranged for such a large party necessitated considerable organisation, as there are no agencies in the various places that are in a position to undertake all the work.

### FRANCE

#### Further Road-Rail Co-ordination Measures

Rail and road co-ordination measures in France, while making substantial progress in regard to passenger traffic, have been less successful hitherto in bringing goods transport by road into effective control under the co-ordination plans. Long-distance hauliers have continued to take the cream of the freight business, leaving the less remunerative commodities to the railways. The hauliers have done this on a competitive basis, often cutting rates unduly in order to secure consignments. This

compelled the railways also to reduce their tariffs considerably.

#### Control of Freight Rates

In the short time that he has held the office of Minister of Public Works, M. de Monzie has resolutely tackled this problem and now, in a further series of Decrees, has given the goods transport co-ordination, which had hung fire for five years, a better chance of practical success. The principal feature of his scheme, which should help the railways to recover some proportion of long-distance goods traffic, is that the road hauliers must impose tariffs at least equal to those of the railways. This will apply to all road services running parallel with the railways. The road carriers will still be free to compete with the railways, but only on the basis of quality of the service.

#### Additional Regulations

M. de Monzie's Decrees, which were signed on October 12, were accompanied by a report to the President of the Republic, summing up the steps taken to make co-ordination effective in the last five years and further measures now recommended. The report claimed that the railways, as a State service, must have priority in all transport associated with State contracts. As far as possible, long-distance traffic should go to the railways and short-distance to road carriers. In rural districts, carriers must have unrestricted freedom of movement in a large area. Taxes on small transporters should be reduced, but increased for large concerns. Inspection and control formalities must be simplified. Administrative interference is to be reduced to a minimum to avoid irritation in the provinces due to red-tape details.

#### Tax on "Collective" Taxicabs

In the Paris suburbs "collective" taxicabs, running to distances of 15 to 20 miles or more, have been doing a thriving business picking up passengers in competition with omnibuses during recent years. This illicit traffic is now to be recognised, but the taxis will be required to charge passenger fares 20 per cent. in excess of the bus fares.

Rural carriers within specified short-distance zones will be free from restrictive regulations, provided they do not engage in further competition with the railways. The administrative authorities undertake that the railways shall not compete with such carriers by cutting transport rates.

#### Equal Tariffs for Rail and Road

For long-distance traffic the railway schedules are very complicated; simpler rates must be arranged for goods carried by road. The task of simplification is to be left to professional groups of transporters, who will undertake the work of supervision and control. A special provision to this effect in the Decree constitutes a charter, for which the hauliers have long been agitating.



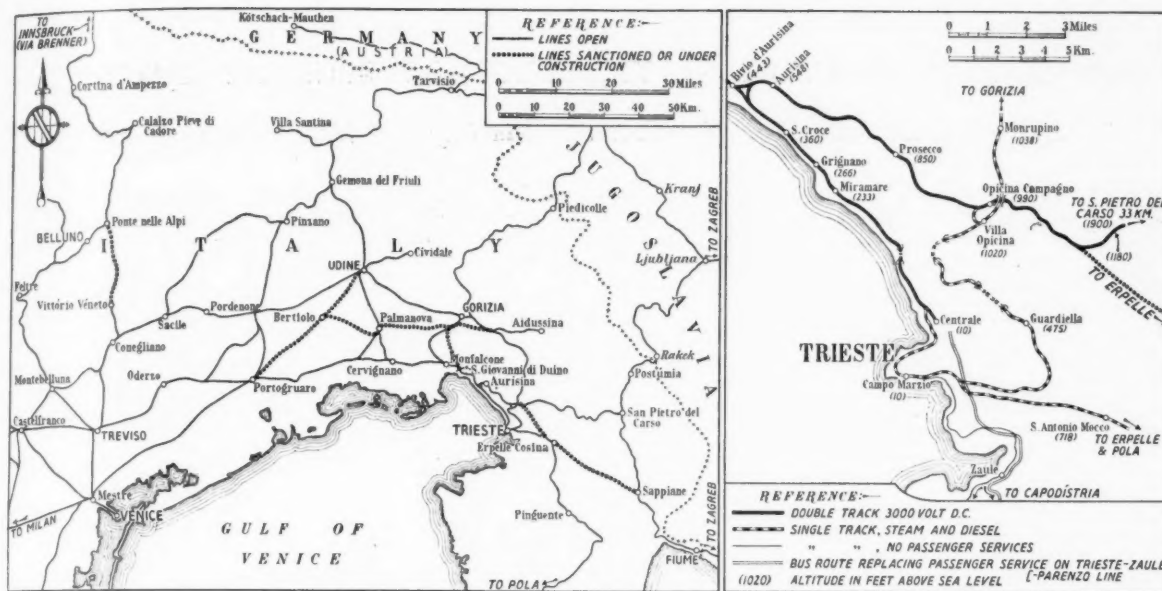
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New railways in North-Eastern Italy

Details of railways around Trieste

The same Decree defines the means which will enable the National Railways Company (S.N.C.F.) to arrange financial co-operation for the transformation of road vehicles or the construction of new vehicles in order to organise combined rail and road services.

#### Technical Assistants

Previous Decrees provided for intervention by the police and *gendarmérie* in cases of infringement of co-ordination regulations. In addition, the professional groups of transporters are now permitted to appoint their own technical assistants to take action in such cases. The Decree also defines the conditions for the immediate levy of a maximum fine of fr. 200 in certain cases.

Many objections were raised by road transporters to the stipulation contained in the Decree of December 31, 1937, that each vehicle must have a *carnet de bord* or book of forms descriptive of the goods carried, as a means of control. The text of the new Decree meets most of these objections. The *carnet de bord* need now be carried only by vehicles likely to offer real competition either to the railways or to regularly authorised public transporters.

[The main points in the new Decrees were outlined in our news pages last week at page 704.—ED. R.G.]

## ITALY

### New Lines under Construction and Projected

To improve communications between the Italian Adriatic ports and the hinterland, the Italian State Railways administration has been ordered to speed up the construction of (i) the Vittorio Veneto—Ponte nelle Alpi railway in order to provide a third

connection between Venice and the Brenner *via* Mestre, Treviso, Conegliano, Vittorio and Ponte nelle Alpi\*; and (ii) the new connections between Portogruaro and Udine through Bertolo and Palmanova, and between Bertolo, Palmanova, Gorizia, and Aidussina. The latter is evidently to be the first part of a new route between Italy and Yugoslavia. Further, the administration has been ordered to complete the detailed surveys and estimates for the construction of the Erpelle—Sappiane railway which will shorten by about 50 km. the distance by rail between Trieste and Fiume, and for the construction of the Erpelle—Opicina line, to permit trains coming from Fiume and Pola to avoid Trieste and run directly *via* Opicina, Aurisina, and Monfalcone onwards to Venice, Milan or Rome. By this means it will be possible and advantageous to run direct trains between Zagreb and Fiume, Venice, Milan, &c., as well as *via* Trieste. It is claimed that these improvements together with the construction of a new connection between Trieste and Gorizia—on the direct line to Munich, *via* San Giovanni di Duino and the Vallone—will allow both the ports of Trieste and Fiume to attract a larger share of Yugoslav trade with overseas countries. The position of Trieste will much improve owing to the fact that at present railway connections with the hinterland are based almost exclusively on the double line from Trieste Central to Bivio d'Aurisina (West) and Aurisina (East) with its 1 in 33 gradient. The electrification of the line has improved matters, but has not solved the problem, and only the construction of the new railways

in question will relieve the congestion of traffic round Trieste. From October 28, 1938, electric railcars are to be run on the Trieste—San Pietro del Carso—Fiume line, thus reducing the journey time from 2 hr. 20 min. to 1 hr. 40 min.

## LUXEMBOURG

### Main Station Rebuilding

The entire rebuilding of the main station in the city of Luxembourg, and the rearrangement of all the tracks in the vicinity, has been virtually completed. It was in view of the increase of international traffic that this scheme was decided upon in 1936. About 20,000 cu. m. of earth have been removed to obtain better approaches, and the new layout comprises 39 miles of track and 300 pairs of points. The cost has been charged gradually to the account of the Ch. de fer de l'Est (France) and later to that of the French National Railways.

## FEDERATED MALAY STATES

### Miscellaneous Notes

The revenue from all sources for the month of August, 1938, was £133,497, compared with £177,552 for the corresponding month of 1937. The total revenue for the period January to August, 1938, was £1,193,433 compared with £1,307,121 for the corresponding period in 1937.

Out of the eleven "O" class locomotives ordered in March, 1937, ten have so far been received.

Work on the modernisation of the Station Hotel, Kuala Lumpur, was completed on September 26.

\* Referred to on page 586 in our issue of March 26, 1937.—ED. R.G.

## DOUBLE-WIRE SIGNALLING, VICTORIAN GOVERNMENT RAILWAYS

*Improved mechanisms designed to increase reliability and facilitate maintenance*

**D**DOUBLE-WIRE transmissions for points and signals were first introduced on the Victorian Government Railways in 1926, but found little use until 1934, when much experimental work was carried out and further installations brought into service. Several improvements were made in the equipment, and signals are now being operated easily at distances up to 1,500 yd., and points up to 850 yd. Novel and interesting features are included in the new equipment, designed to overcome the disadvantages of that previously used.

With the earlier types of signal mechanism, a clear signal was liable to be improperly displayed in the event

wheel *A* (Fig. 1, *a*, *b*, and *c*) and a circular cam plate *B*; these are capable of independent rotation about a common axis *C*, but can be coupled together by a releasable clutch mechanism *D* and *E*. They rotate in unison during normal operation, but are automatically uncoupled should the return wire break. The clutch arm *D*, located in the rim of the pulley *A* and pivoted at *F*, carries a roller *G* engaging under tension with a projection *E* on cam plate *B*.

The pull wire is connected to the clutch arm *D* at *H* and passes round the pulley; *A* and *B* are mounted on base plate *I*, movement being imparted to the signal

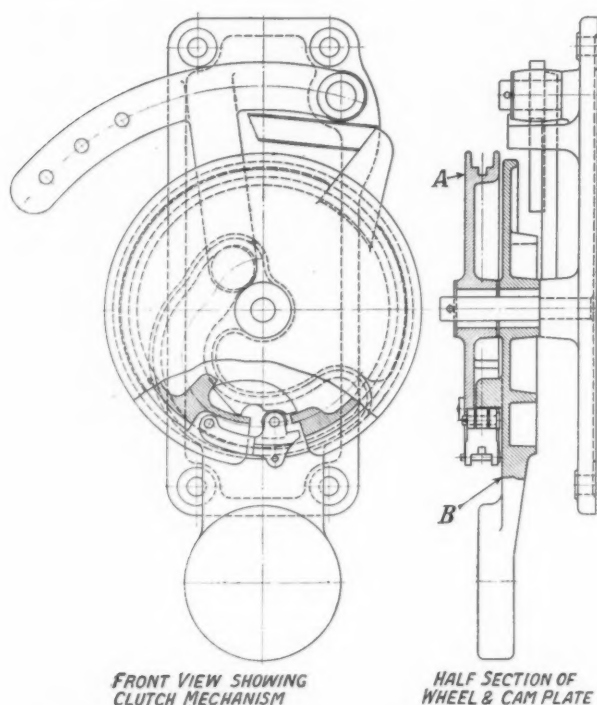


Fig. 1a

of the return wire breaking. The new mechanism was designed to overcome this by the use of a disengaging clutch mechanism illustrated in Fig. 1. The new type of point machine simplified the layout of the equipment and increased the efficiency of operation, maintenance being considerably facilitated; new improved methods of mechanical detection were also adopted, the designs being suitable for both double- and single-wire working and having distinct advantages over the hatchet and slide types now widely used. These improvements, which have been patented, were designed by Mr. F. W. Harvey, Assistant Engineer, Signal & Telegraph Division.

### Signal Mechanism

The signal mechanism is of the cam plate type and consists essentially of two elements, a grooved pulley

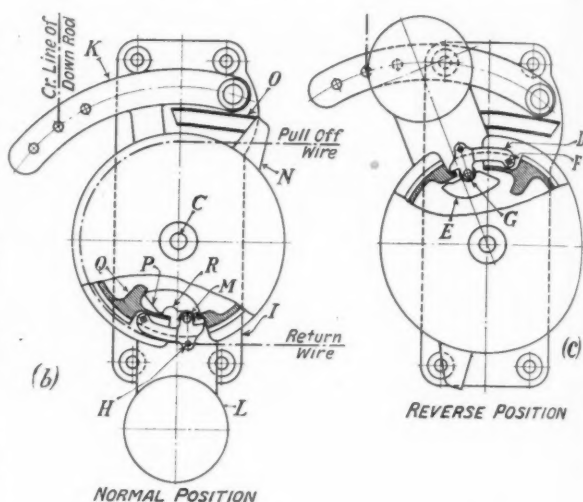


Fig. 1b

Fig. 1c

through the crank *K*, one arm of which is connected to the signal down rod, while the other engages with the cam path on *B*. The crank *K* is also mounted on the base plate. If a wire breakage causes the pulley to rotate, disengagement of the clutch arm *D* with the projection *E* occurs owing to release of tension in the wire. If the signal is at "danger," the cam plate remains normal and maintains it so, but if the signal is at "clear" the balance weight *L* returns it to danger. The clutch arm *D* is kept in training on its pivot by a limited degree of radial movement each time the signal is operated. Roller *G* is normally set out of engagement with the notch *R*, as shown at *M*; the projection *Q* on the wheel holds the cam plate projection *N* against the stop *O* on the base plate. In normal operation idle movement of the pulley occurs until roller *G* engages in notch *R*, but on the signal being returned to danger it lifts out of the notch and assumes its normal setting.

In the event of the wheel becoming uncoupled from the cam through any cause other than a broken wire, the clutch is re-engaged by operating the hand lever from reverse to normal when the roller *G* rides over the ramp *P* to assume its normal setting.

The projection *Q* is provided to engage with the projection *E* on the cam plate, and prevent the cam being

held in the reverse position when the wheel is operated to the normal.

#### Point Mechanism

This was designed to facilitate ready inspection, adjustment and maintenance, and reduce to a minimum the idle travel in the transmission between the withdrawal of the plunger and the movement of the point blades. Simplification of associated mechanisms and connections is also obtained.

Figs. 2a and b give a plan view with cover removed, and a central transverse section of the motion wheel,

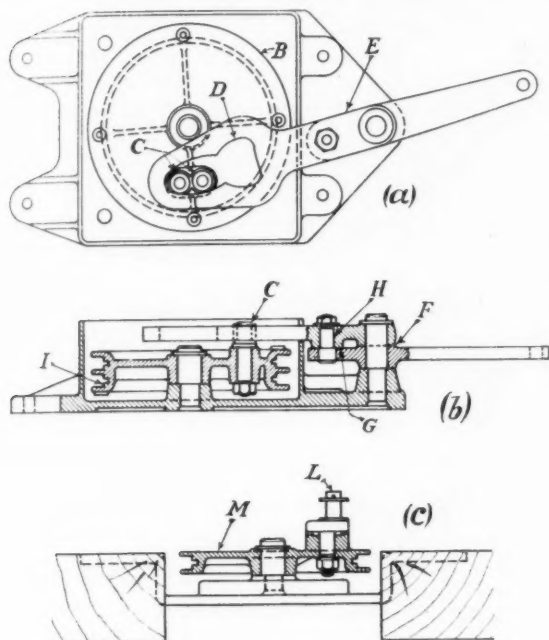


Fig. 2

shown in its central position with operating rollers engaged with the cam. The case is of cast iron, fitted with a sheet steel cover. Motion wheel B carries on its upper face a pair of concentrically-aligned rollers C, which engage with the cam slot D in one end of the crank arm E, itself divided as shown at F, its two sections being connected at G by a shear pin H to avoid damage to the mechanism should the points be run through. Inspection and maintenance are readily effected without removing the motion

wheel or disturbing the transmission wires. The reduction in idle travel was obtained by using a pair of rollers and suitably shaped cam, instead of the one roller generally used with this type of movement.

Wheel B has a double groove in its rim, groove I being used when points and lock bar are operated by a single lever, and motion transmitted through a chain to wheel K (Figs. 3a and b), which in turn operates the lock bar and plunger, usually by means of connecting rods and cranks. In an alternative arrangement a motion wheel M, Fig. 2c, may be used in place of the crank to control and operate the lock bar. Movement of the latter is then effected by chain drive from wheel K, its rim having a second groove for the purpose. Adjustment of lock bar travel is provided for by an adjustable eccentric stud L.

When a lock bar is operated by a separate lever, the transmission wires are connected directly to wheel K.

#### Mechanical Detectors

To overcome detection difficulties in double-wire transmissions due to temperature variations, new designs of detector have been prepared to suit varying conditions. Type 1 (Fig. 4a) consists of two pulley wheels coupled together in the same manner as the pulley and cam plate of the signal mechanism, and mounted vertically on a base through which the detector blades from the points pass transversely. Pulley A is similar to pulley A of the signal mechanism, but B is a grooved wheel, with a detecting snib C cast on its inner edge.

Type 2 (Fig. 4b) consists of a pulley wheel G having two grooves H, carrying a detecting snib A, capable of adjustment around the wheel for varying clearance B. The snib is held in position by plate C, which has serrations D engaging with others, E, on the snib face. Slotted holes F allow of circular movement on the wheel.

Type 3 (Fig. 4c) is a modification of Type 2, and has a snib solid with the wheel.

Conditions vary according to whether: (a) The signal is a long distance outside the points; or (b) the signal is close to the points.

In case of (a) temperature variations may alter the adjustment of the detector so that the points become locked. This is overcome by dividing the double-wire signal transmission at the points, so that the compensator does not act on the portion between the points and the signal. A dividing wheel similar to Type 1 detector, with the exception that the detecting snib is omitted, is placed close to, and on the lever side of, the detector. Type 3 detector is then used, connected as shown in Fig. 5a. Alternatively, the dividing wheel may be combined with the detector as a complete unit. Type 1 detector is so

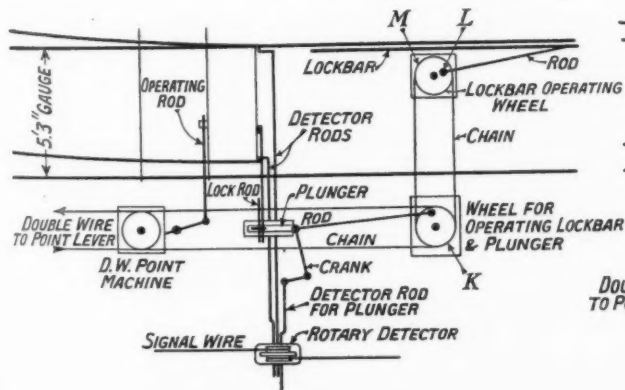


Fig. 3a

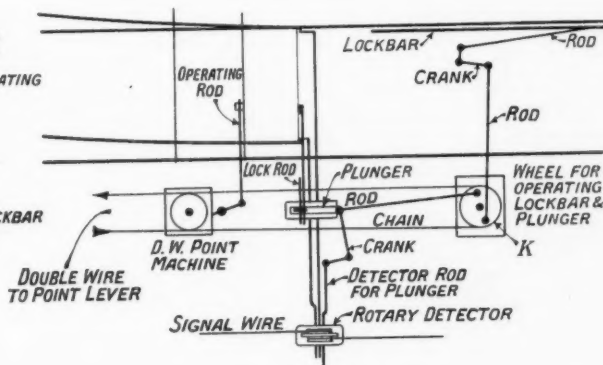
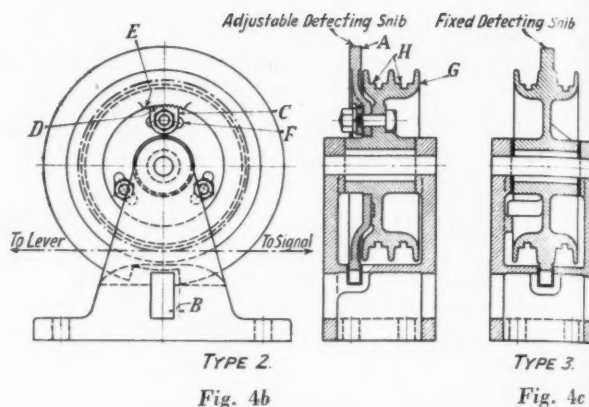
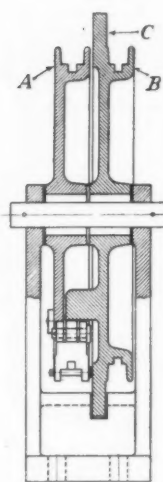
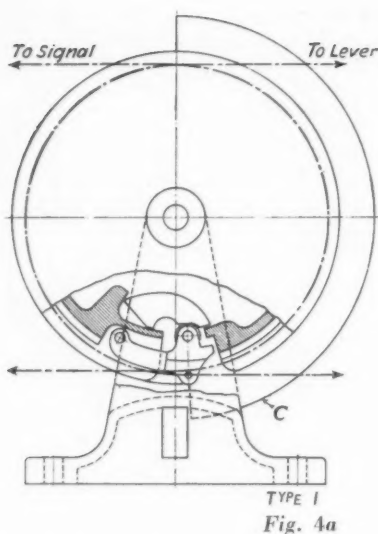


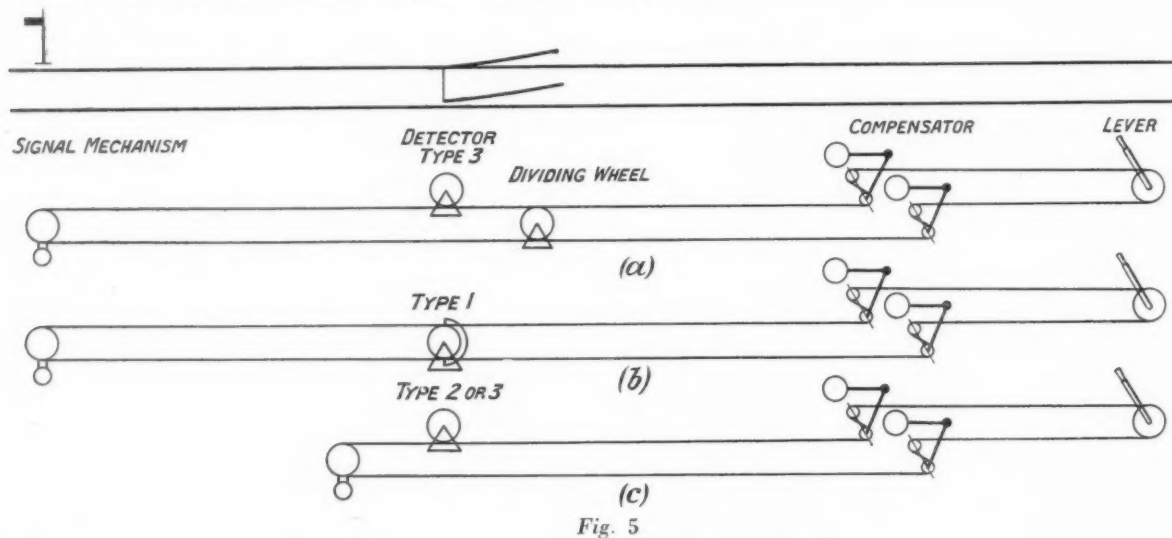
Fig. 3b





designed, and applied as in Fig. 5b. The disengaging clutch mechanisms on the dividing wheel and detector are provided to ensure a danger signal being exhibited should a wire breakage occur between the lever and detector, or lever and dividing wheel. Types 2 and 3 are

also used when the signal lead is not divided (Fig. 5c), while Type 2 can be used, within limits, when the signal is placed some distance outside the points and the lead is undivided. By increasing clearance at B some movement may be imparted to the detector without locking the points, its amount being governed by the normal idle travel in the signal mechanism. The clearance will be a maximum at low temperature, but must not be sufficient to permit of the signal being moved if the points are not properly set.



### The First Railway in Prussia

The Berlin-Potsdam Railway, the first in Prussia, was opened throughout on October 29, 1838, exactly a hundred years ago. The section between Zehlendorf and Potsdam had been inaugurated a few weeks earlier (on September 22, 1838) and gave Berliners their first sight of a steam locomotive. The line speedily attracted a good traffic; 700,000 persons were conveyed by the end of 1839, and the line carried in five years as many passengers as the road vehicles had conveyed in the preceding fifty. Goods traffic was, however, small at first. The line owed its inception chiefly to the activities of a civil servant named Robert, with whom an engineer named Crelle became associated. As was common with many early railways, the original estimated costs were greatly exceeded. At first three locomotives were obtained from Stephenson

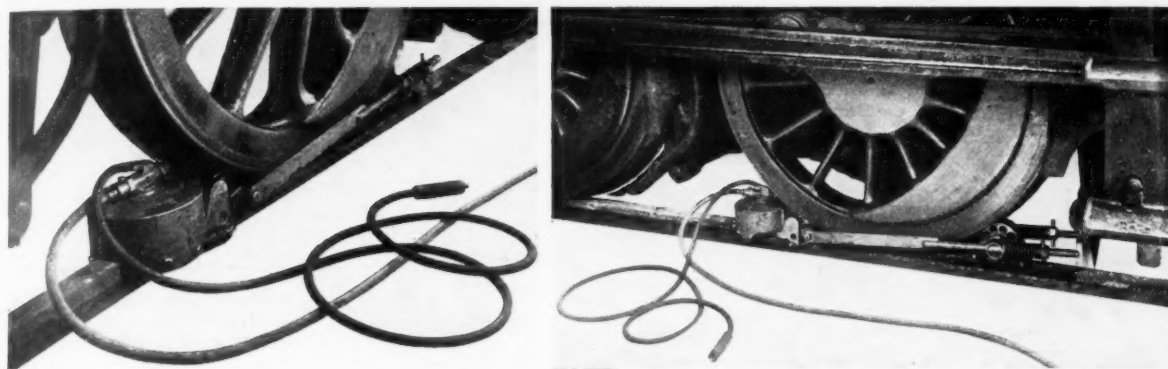
in England, and subsequently seven more, but most of the carriages were built in Prussia to English designs. The Potsdam-Magdeburg Railway, sanctioned in 1842, absorbed the older line in 1844. Both were originally single lines but doubling was practically complete in 1858. They were taken over by the State on April 1, 1880. The Berlin terminus was rebuilt in 1872 and two years later the so-called Wannsee loop line was made. Four tracks were completed all the way to Potsdam in 1891. In 1903 non-stop business trains were introduced. Experiments with electric working were made about 1900 but it was not till 1933 that the line was electrified as part of the Berlin suburban system. The centenary has been celebrated by running the facsimile *Ludwigsbahn* train over the line, and by musical and theatrical performances

## A POWER-OPERATED PINCH BAR

### *A useful device for locomotive valve setting*

THE accompanying illustrations show a patent pneumatically operated pinch bar, designed for the purpose of setting locomotive valves. It is marketed by Federated Engineers Limited, 3, Central Buildings, London, S.W.1. The customary method of performing this work in this country involves the raising of the driving wheels clear of the rails and turning the motion by means of a power-driven set of rollers. This method is confined to workshops equipped with the necessary mechanism. In

It can be located on either side of the wheel to be moved in a few minutes and without the use of any special tools. This may be desirable if, for instance, the valve setting is to be carried out on an engine working for a considerable portion of its time in back gear, so that the valves are first set for forward motion and in a few minutes the direction of driving can be reversed to set or check up in reverse gear. The machine is operated by push button and is in the hands of the valve setter himself at his point



*Position on each side of wheel for locomotive valve setting*

running sheds and other works, however, the usual procedure is to move the locomotive by means of pinch bars, for which several labourers are required.

The apparatus illustrated enables the valves to be set in any workshop or running shed where compressed air is available, on a sufficient length of level track, only one man being required to operate the mechanism and set the valves. As it is not generally held to be desirable in valve setting, when once a desired point has been passed, that the motion should be reversed, the apparatus is intended to work in one direction only.

of observation at the steamchest. He can control the movement of the locomotive from  $\frac{1}{2}$  in. at a time up to a speed of 3 ft. per min. The adjustable carriage incorporated with the mechanism is held close up to the side of the wheel remote from the apparatus by means of the stiff springs embodied in the couplings; it draws the pinching apparatus bodily forward and the engine is thereby firmly held at any desired point. The power of the machine is such that it can move two locomotives weighing together 200 tons, with an air pressure of 90 lb. per sq. in.

### **Railway Preparations for New York World's Fair**

Preparations are now forging ahead for the New York World's Fair next year, where an attendance of 50,000,000 is expected, and arrangements are being made for handling 600,000 visitors daily, and up to 160,000 in a single hour, according to our American contemporary, the *Engineering News-Record*. Of this 160,000, the three-track Corona-Flushing line of the Interboro and B.M.T. rapid transit systems, the Port Washington line of the Long Island Railroad, and the Queens Boulevard line of the Independent Subway are preparing to carry a maximum of 100,000 passengers an hour between them. This expected great volume of traffic is necessitating extensive enlargement of stations, widenings, and resignalling works, as well as a one-mile double line extension of the Queens Boulevard line right into the central area of the exhibition. This line is being equipped to handle 40,000 passengers an hour. A similar capacity is aimed at on the Corona-Flushing line, by enlarging Willets Point Boulevard station and by equipping the three tracks with signalling and layouts suitable for fast service. A new World's

Fair station on the Long Island line is being built with four extra tracks for a shuttle service to take 14 min. from the Pennsylvania station in the heart of Manhattan, and cater for 20,000 passengers an hour. Through excursions from the Pennsylvania system will also use this route.

**LEAD-ACID TRAIN-LIGHTING ACCUMULATORS.**—A revision of the British Standard Specification of 1932 for lead-acid train-lighting accumulators (Plante and Faure type) is announced, in which the subject matter has been re-arranged and amplified where experience has shown this to be desirable. A schedule of particulars to be completed by the manufacturer when tendering, and an Appendix specifying the method of determining the internal resistance where specially called for, have been added. Copies of this revised British Standard (No. 454-1938) may be obtained from the British Standards Institution, 28, Victoria Street, London, S.W.1, price 2s. 2d., post free.

## PECULIAR BELGO-GERMAN FRONTIER ARRANGEMENTS

*Unusual rail and road territorial adjustments to meet the difficulties of the post-war Eupen boundary*

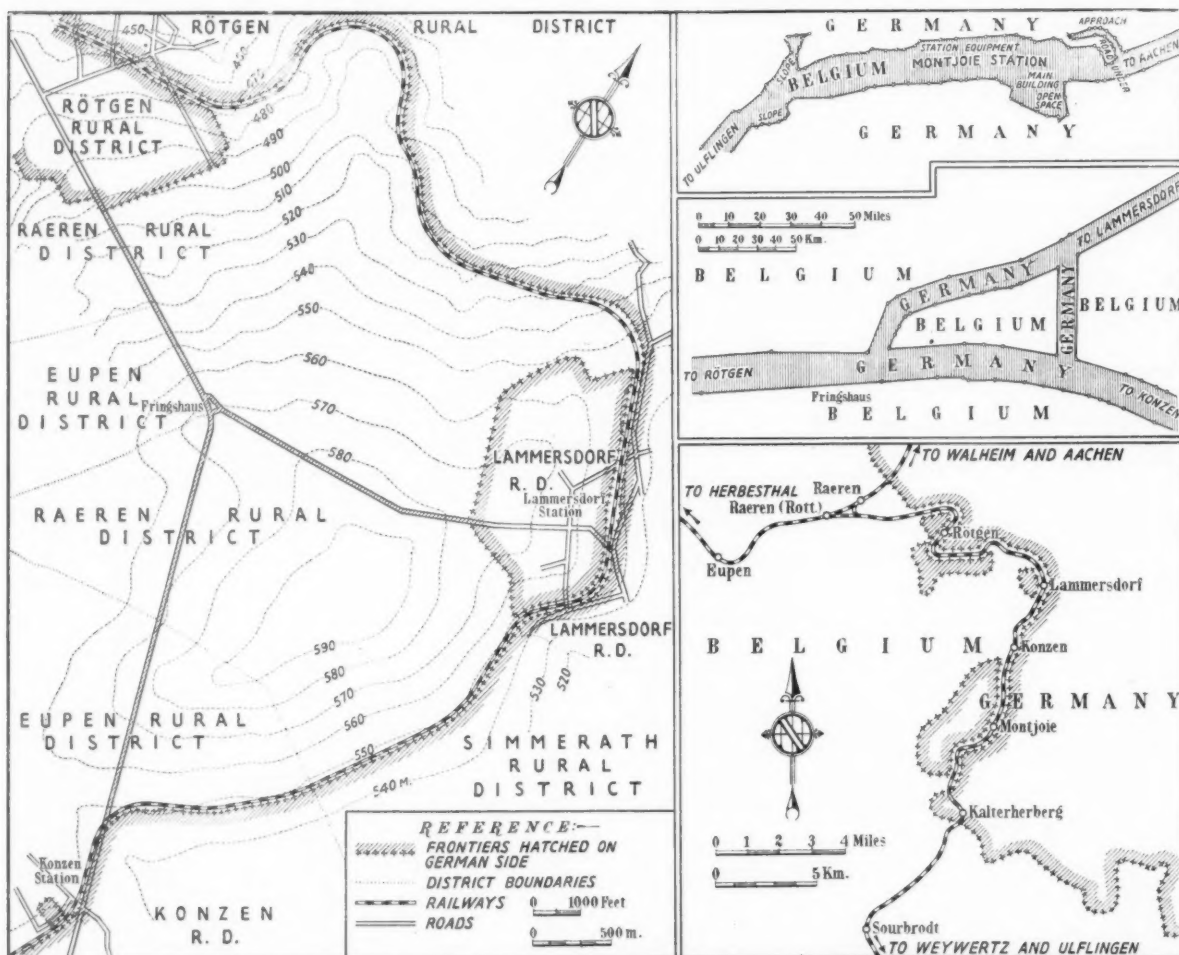
AS the result of the work of a boundary commission composed of a Belgian, a German, an Englishman, a Frenchman, an Italian, and a Japanese, peculiar rail and road arrangements were made on the Belgo-German frontier in the Eupen district to meet local difficulties caused by the territorial modifications embodied in the Versailles Treaty. The new frontier involved interference with the railway built by Prussia in 1885-1889 between Aachen and the Luxembourg border near Ulflingen, as in the neighbourhoods of Rötgen and Konzen this line would still have passed through some German rural districts, at Rötgen and Lammersdorf, and also a very small piece of Konzen.

It was decided, therefore, to constitute the railway track and station areas Belgian territory, forming narrow "corridors" between German areas, and making Belgian the whole railway serving the newly-acquired Belgian territory. On the other hand, the three highways connecting the German "islands," which meet at Fringshaus, in

the middle of a Belgian area, are still German territory, although the tiny triangular isolated centre piece at the junction point is Belgian, making what must surely be one of the oddest juxtapositions of territory ever conceived.

An interesting article on the subject by M. A. Jacobs of Brussels was published recently in our Netherland contemporary, *Spoor-en Tramwegen*, and to this we are indebted for the detail sketch maps reproduced below.

This solution of a frontier problem is of topical interest at the moment in view of similar difficulties arising from the re-adjustment of the Czech-German frontier, as the result of the cession to Germany of Sudetenland. In the latter case we understand that the solution is being found by an arrangement between the two Governments whereby "national trains" will be introduced that will pass through foreign territory without stopping, and without frontier formalities, on journeys between points in the same country that involve such foreign transit.



*Belgo-German frontier arrangements in the Eupen district*



## AVALANCHE PROTECTION IN FRANCE

*Covered way built to protect the P.L.M. Mont Cenis main line*

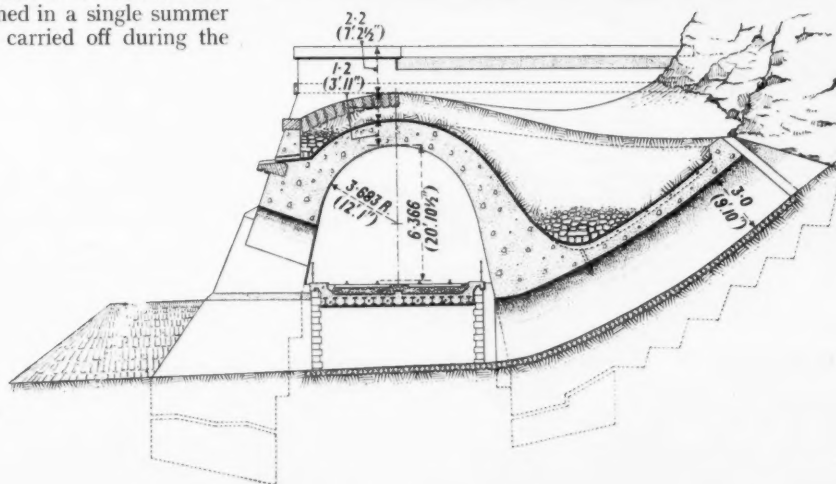


*Covered way to protect the P.L.M. line near Modane. The interior view below shows conductor rails for 1,500-volt electric current*

AT a point between Culoz and the Italian frontier station at Modane the main line of the P.L.M. (now the S.E. Region of the French National Railways) crosses the path of an avalanche by a 20-ft. bridge. In winter time the bridge is inadequate and avalanches have covered as much as 130 ft. of track and piled up 45 ft. high. To avoid these interruptions, and also to protect the line against the danger of falling rocks, a covered way has been built, 180 ft. long, and so designed as to throw the avalanche over and clear of the line. The space between the mountain side and the covered way has been filled in and a thick layer of earth placed on the top to form a cushion on to which rocks may fall from the overhanging cliff without damaging the structure. To prevent this protective layer from being carried away by the avalanche, it is covered over the outer half of the arch with hand-packed dry stone rubble. Concrete was used for the construction rather than stone on account of the speed with which the work had to be carried out. The whole had, in fact, to be finished in a single summer lest the unfinished construction be carried off during the winter by the avalanches.

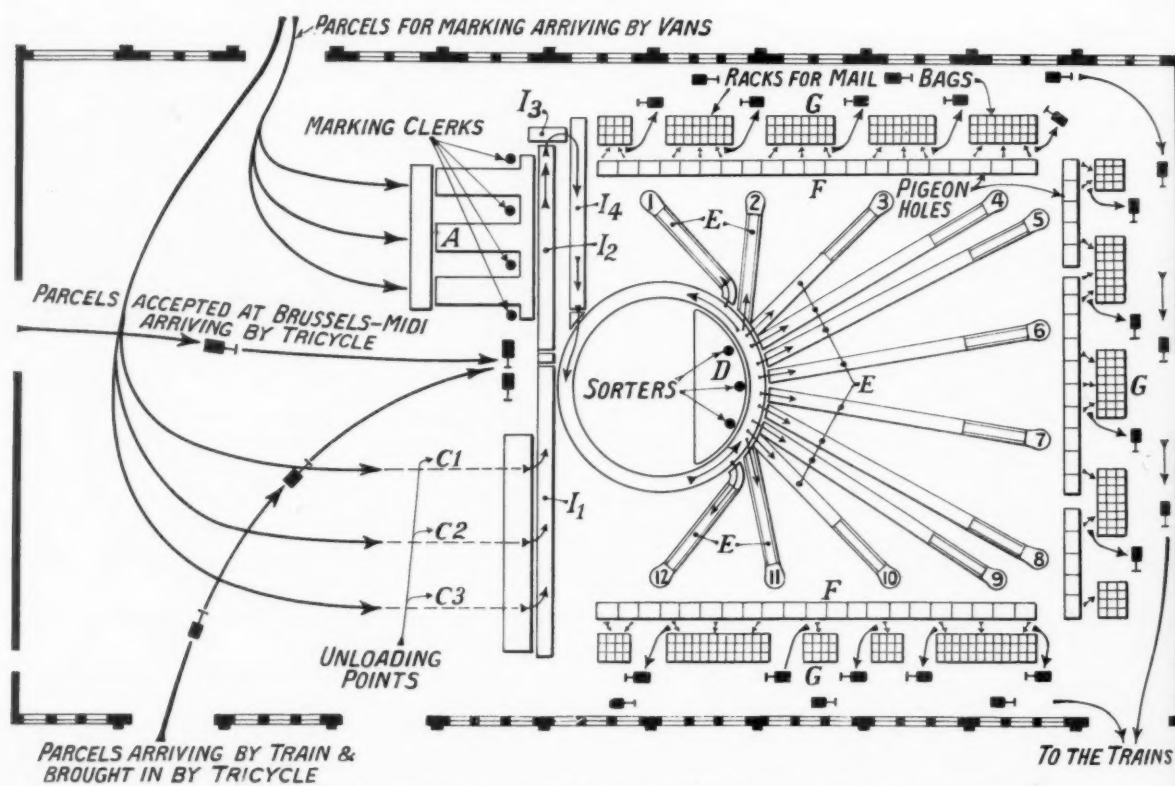


*Cross-section of covered way built to protect the electrified main line of the S.E. Region, French National Railways, near Modane. The structure is of reinforced concrete and the roof is protected against damage by falling rocks by a thick layer of earth covered with hand-packed rubble*





General view of sorting office, with pigeon-holes for parcels after preliminary sorting on right, and mailbag racks beyond



PARCELS ARRIVING BY TRAIN & BROUGHT IN BY TRICYCLE

Course of parcels through sorting office to racks on which they await collection for despatch by train

PARCELS SORTING OFFICE AT BRUSSELS (see article opposite)

## PARCELS HANDLING ON BELGIAN NATIONAL RAILWAYS

*A depot at Brussels arranged for handling and sorting some 20,000 parcels in a day*

THE Belgian National Railways have the exclusive right of conveying parcels traffic, which is accepted at all their own stations and receiving offices, and at those of the *vicinal* railways. Parcels are also received at post offices, but the Belgian postal service does not itself convey them, although letters and printed matter are carried without limit of weight. The railways collect parcels on request at the homes of all consignors in areas served by their vans (accounting for about 75 per cent. of the population). Where the place of delivery is not directly served by the National Railways, parcels are sent on over the *vicinal* lines or by motorbus routes, and in such cases delivery is made by the Post Office, which is paid for doing so by the railways. The railways deliver parcels themselves wherever they have direct connection, and issue their own parcels stamps.

The most important part of the sorting work is centralised at Brussels, where an interesting installation has been made to facilitate the sorting of some 20,000 postal packages a day.

The main element of the sorting installation is a circular belt conveyor, 32 ft. in outside diameter and 28 in. wide. This rests on 16 bearings and is kept constantly moving by a 1½-h.p. motor with a speed-reducing worm gear, transmitting its power through a rubber-covered friction wheel pressed against the belt. At one side of the conveyor belt is the feed which carries the packages on to it, and at the other side are the transporters which carry them away.

The feed consists of a series of 28-in. conveyor belts. As the packages arrive from the various post offices, they are already marked with their final destination, indicated by conventional signs. These packages are emptied at C1, C2, C3 (on diagram) on to the first of the feed belts I1, which carries them to conveyor I2. In front of this second conveyor a table A is placed for the marking of any parcels which come into the station direct. These are then placed on the same conveyor and carried on with the other parcels



*Incoming parcels progressing to sorting point. Pile in background awaits marking*

by the belts I3 and I4 to the circular belt. At the side opposite that at which the parcels arrive, the belts which carry them off are placed. Opposite them, inside the ring at D, are three sorters. As the parcels pass them, they have only to give them a push as they come opposite the correct one of the 12 removal conveyors E.

The belts carry the bundles to a series of tables (1 to 12) placed at their ends. Here they are received by sorters who place them in a series of pigeon holes, from which they are taken for final sorting by further sorters, who put them in the 186 divisions of racks G for collection and forwarding by the proper train. This system has been found not only to accelerate handling parcels in the Brussels station, but to improve its capacity so much that it has been possible to centralise all the sorting for Brussels in this one spot, instead of distributing it as before among a number of branch stations as well.



*Delivery side of circular conveyor, with parcels reaching position at which they are pushed by sorters on to removal belts*



## LOCOMOTIVE SIX-DAY SCHEDULE AND PROGRESS BOARDS

*Time-saving measures in use in the erecting shop  
at the St. Rollox locomotive works, L.M.S.R.*

A SIX-DAY working schedule is in operation in the erecting shop at the St. Rollox works of the L.M.S.R., which deals with both general and service repairs for the locomotives in the Northern Division. The photograph which, by the courtesy of Mr. W. A. Stanier, Chief Mechanical Engineer, we reproduce herewith, shows a board that has been fixed in the shop to show pictorially the condition of the engines at each stage, and also the details required at the different stages; the numbers of

the engines being dealt with in both bays appear on movable slides underneath.

This board, the scheme of which was explained to us during a recent visit to the works, is additional to the ordinary progress board used in the various supply shops, and while it does not actually indicate any material on delay and is not itself used as a progress board, it does show generally to those in the shop the position that should exist at any given time and is very helpful in



*Locomotive six-day schedule board in erecting shop, St. Rollox works, Glasgow, L.M.S.R.*

1st DAY		2nd DAY		3rd DAY	
Stripping	Examination	Cyl. and details Hind casting Cross stays Motion plate Hornblock sizes Hornclips returned to E.S. Boiler in E.S. for clothing Welding Comp.	Oil boxes & pipes Hornblocks Elements Ret. Cyl. boring comp. & sizes to M/C shop	Sp. hanger bkts. Bk. hanker bkts. Piston valve liners Blr. & Eng. piping complete Slide bars Back cyl. covers Riveting complete S.B. saddle casting Bunkers, cab & splashers Cab pillars Cab roof	Rev. rod Blr. in Bogie centre Mech. lub. Sp. screws, pins, &c., complete Axlebox sizes Piston valve sizes after boring Buffer beams complete Port facing complete
2 BAY		2 BAY		2 BAY	
4313		16256		670	
3 BAY		3 BAY		3 BAY	
909		5636		17415	

*The above are reproduced in order to facilitate the reading*

pointing out to visitors and others the system in operation. In addition, it has the psychological virtue of impressing upon the men what is expected, and is a ready means of checking up the position by those in authority.

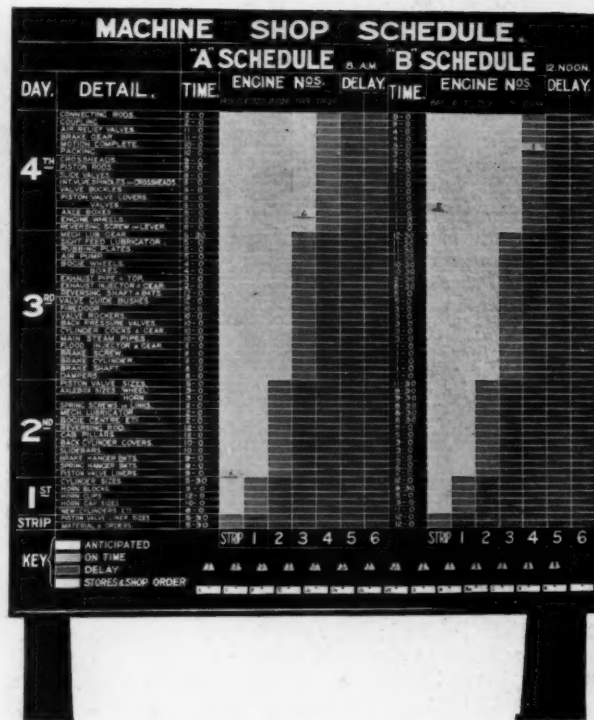
The progress board is located in the machine shop of the works, and is illustrated in the adjoining illustration; on the left-hand side are shown the various details and times required by the erecting shop. The remainder of the board is divided into two sections covering "A" Schedule and "B" Schedule respectively. Each section is split up into three parts; the first, for expected delays, is painted yellow, the second, showing the day the material is required, is painted green, and the third, indicating material on delay, is painted red. At the top of each section are loose strips with the engine numbers, which are moved forward one position each day.

The object of the board is to draw attention to any material not following its normal course, i.e., it may be on delay or require special attention to avoid being late for delivery. The actual position of such material is indicated by metal tabs marked with the letter of the shop or section of the shop holding the item. In the case of a detail being repaired for re-fitting to an engine, a small tab is used alone, but should special parts require to be manufactured or material be needed as part of a stores order going through the shops, then a plain rectangular tab is mounted behind the small tab. These tabs are also moved forward daily in conjunction with the engine numbers. The position of the tabs in the illustration of the board shows that:—

1.—Engine No. 14505 on the stripping pit requires piston valve liners which are at present in "K" shop (iron foundry), being made to a stock order, and may arrive late for machining.

2.—The axleboxes for engine No. 1183 due at 8 a.m. the next day are for some reason behind schedule in N.A. shop (heavy brass shop).

3.—In the case of engine No. 14488 the motion is due but has not been delivered, the delay being due to some detail from "C" shop (brass foundry).



Progress board in machine shop

4.—Engine No. 665, now on the stripping pit, will require piston valve details at present in "R" shop (smithy) which will possibly be delivered late.

The introduction of this board has been of great assistance to section foremen and chargehands in enabling them to foresee what will demand special attention from their sections. In other words, the board is an attempt to forestall delays rather than wait for them arising before giving them special attention.

4th DAY		5th DAY		6th DAY
Bk. Screw	Exhaust inj. & gear	Rev. screw and lever	Vac. ejector	Valve setting complete
Damper Comp.	Exhaust pipe & top	Eng. wheels, axleboxes, and springs	Chimney	Engine and tender coupled
Bk. cyls. and shaft	Bogie wheels, boxes, and springs	Valve spindle	Bk. gear	Trial run
Flood inj.	Air pump and valve	Piston valve covers back and front	Whistle gear	Despatch
Main steam pipes	Air reservoir	Slide valves	Air relief valves	
Cyl. drain cocks	Sight feed lubr.	Piston rods, cross-heads	Wheels	
Back pressure valves	Rubbing plates	Blower cock and details	Brake complete	
Valve rockers	Mech. lubr. gear	Motion complete	Sand pipes	
Firedoor		Packing	Coup. & conn. rods	
Faceplate front			Drawgear and buffers	
Valve guide bushes			Engine completed and weighed	
Smokebox comp.				
Side tanks and Union pipes				
Rev. shaft bkts.				
2 BAY		2 BAY		2 BAY
2563		15223		—
3 BAY		3 BAY		3 BAY
17655		2748		14486

of the entries in each section of the pictorial board

*The waiting room for the President of Czechoslovakia at the railway station at the suburb of Dejvice, near the Prague Castle*



*Signal cabin at Johannesburg recently destroyed by fire, as described on page 971 in our issue of May 20. The cause of the conflagration was the collapse of the overhead wiring on to the rails close to the gantry shown. The equipment destroyed was supplied by the Westinghouse Brake & Signal Co. Ltd. On the right of the cabin is the temporary lever frame being erected; it subsequently had a cabin built round it. Temporary electric signalling was re-introduced in the remarkably short space of 10 days*



*As a result of the fire all trains had to be hand-signalled as in the illustration alongside. This temporary method of control was directed by telephone, one of the instruments being in the temporary shelter seen on the platform. Only four of the eleven platform lines could be used, and all points had to be hand worked and wedged during those 10 days*

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## RAILWAY NEWS SECTION

### PERSONAL

#### RAILWAY CLEARING HOUSE

The Railway Companies' Goods Managers' Conference, at a meeting at the Railway Clearing House on October 20, elected Mr. A. E. Sewell (Goods Manager, Southern Scottish Area, L.N.E.R.) to be Chairman of the conference for the year 1939.

On October 10, Sir Edward Beatty, G.B.E., K.C., LL.D., celebrated the 20th anniversary of his having taken over the reins as the chief executive of the Canadian Pacific Railway. He succeeded the late Lord Shaughnessy on October 10, 1918.

Among the bequests of the late Mr. Edward Kynaston Burstal, M.Inst.C.E., who died on August 3, aged 87, was one of 50 guineas to the London & South Western Railway orphanage at Woking.

Mr. P. H. Maffin, O.B.E., M.C., has been elected a Director of the South Indian Railway to fill the vacancy on the board caused by the death of Sir Vivian Jarrad. Mr. Maffin was sometime Secretary of the Indian Railway Board and more recently and until his retirement in May, 1936, Agent of H.E.H. the Nizam's State Railway.

Mr. H. J. Main has been appointed General Superintendent, Saskatchewan District, Canadian Pacific Railway, as from August 1. He was born at Kemptville, Ontario, in 1885, and joined the C.P.R. in 1902 as an operator and agent. In 1911 he became Train Despatcher at Ottawa, and Smiths Falls successively, and two years later was promoted to be Chief Train Despatcher at the latter station. In 1918 Mr. Main was selected as Assistant Superintendent, Farnham, Quebec, and in 1920 became Relieving Superintendent, Eastern Lines. Later in the same year he was appointed Car Service Agent, Quebec District, Montreal, and in 1921 Relieving Superintendent, Quebec District. Subsequently he held the post of Superintendent at Toronto (1922), at Moose Jaw (1927), at Saskatoon (1930), and of acting General Superintendent, Manitoba District (1934). It was later in that year that Mr. Main was appointed General Superintendent, Manitoba District, whence he now goes to Saskatchewan.

Mr. W. A. Fraser, Engineer (Scotland), L.N.E.R., who as recorded on October 14 will retire on October 31, was born in Inverness, where he was educated and trained as a civil engineer. After serving six years on the engineering staff of the Caledonian Railway in Glasgow, first in the Head Office on construction work and later in the Western District on maintenance work, he joined in 1903 the new works staff of

act as Assistant Engineer until he was appointed a few months later to the position of Engineer-in-Chief. On the formation of the London & North Eastern Railway, Mr. Fraser was appointed Engineer, Southern Scottish Area, and became Engineer (Scotland) in 1926, when he assumed control of the former Great North of Scotland Railway. Mr. Fraser is well known in railway circles and has contributed many papers to engineering societies, including a report to the International Railway Congress in Paris last year on methodical and periodical maintenance of: (1) metal bridges; (2) signals; (3) metal supports carrying the contact wire on electric railways. Mr. Fraser is also Engineer to the Forth Bridge Railway Company, and was awarded a Telford premium by the Institution of Civil Engineers for a paper read in London on the reconstruction and strengthening of the floor of the Forth bridge.

Mr. A. Liardet and Mr. Henry Spurrier jun. have been appointed directors of Leyland Motors Limited.

Mr. H. A. Lee, Assistant General Agent, Passenger Department, Canadian Pacific Railway, New York City, has been appointed to succeed Mr. William McIlroy as General Agent, Passenger Department, Los Angeles, as from October 1.

Mr. McIlroy, who retired under the pension regulations, served the Canadian Pacific Railway at various points in Ontario for 29 years before being transferred to the United States in 1920. He started as a telegraph messenger in St. Thomas in 1891 and served in increasingly important posts in Galt, Toronto, Brantford,

Peterborough, and Hamilton; returned to Toronto in 1915 as City Passenger Agent and became Chief Clerk in the District Passenger Office the following year. In 1920 he went to Detroit as General Agent, Passenger Department, transferring to Los Angeles in the same post in 1922.

Mr. Harold A. Lee has served the Canadian Pacific Railway entirely within the United States. He was at Boston, Mass., from 1913 until 1929, serving successively as stenographer, ticket clerk, City Ticket Agent, City Passenger Agent in 1919, Rail Passenger Agent in 1929, and District Passenger Representative later the same year. On October 15, 1918, he enlisted with the United States Navy, and returned



Photo]

[Lafayette

Mr. W. A. Fraser, M.Inst.C.E.  
Engineer (Scotland), L.N.E.R., 1926-38

the North British Railway. Until 1907, when he was appointed Chief Assistant in the New Works Department, Mr. Fraser acted as Resident Engineer for a widening of the Edinburgh, Bathgate, and Glasgow main line between Westcraigs and Caldercruix, and subsequently acted in a similar capacity for a new line into the naval base at Rosyth and an extensive widening of the main lines between Bellgrove and Parkhead in the City of Glasgow. In 1909 he was appointed District Engineer for the Northern District, which in addition to the permanent way and works maintenance, carried the supervision of the Tay bridge and the docks at Methil, Burntisland, and Alloa. In 1911 he was recalled to Edinburgh to

to his post the following January. In 1934 he became Assistant General Agent at New York City.

Mr. A. E. Kirkus, O.B.E., Director of Statistics and Rates in the Ministry of Transport, will retire on October 31. He began work in the service of the Hull Dock Company, and was subsequently employed by the North Eastern Railway in the District Goods and Dock Manager's Office, Hull; the General Manager's Office, York; and the Traffic Statistics Office, York. Mr. Kirkus joined the Ministry of Transport in August, 1919, and was appointed Assistant Director of Statistics. In March, 1922, he was appointed Director of Statistics, in which position he was responsible for the compilation of statistics relating to railways, canals, tramways, trolley vehicles, public service vehicles, road traffic, road accidents, highway expenditure, and so on. In January, 1932, Mr. Kirkus was made responsible also for the work of the Rates Branch which deals with matters relating to rates, fares, and charges of transport undertakings. He was a Member of the Permanent Consultative Committee on Official Statistics from 1922 to 1938, and Chairman of the committee appointed in 1921 by the Minister of Transport to consider the annual return relating to tramways and trolley vehicle undertakings. Mr. Kirkus was also a Member of the committee appointed in 1928 by the Secretary of State for the Colonies to consider what statistics are necessary for Colonial Railways; and of the committees appointed by the



[Photo]

[Vandyk]

**Mr. A. E. Kirkus, O.B.E.**

Director of Statistics, Ministry of Transport, 1922-38

League of Nations to consider the unification of transport and of road accident statistics. In 1935 he was a Delegate at the Conference of British Commonwealth Statisticians held in Ottawa in 1935. Mr. Kirkus was General Reporter at the International Railway Congress in London in 1925,

and a delegate of the British Government at the Congress in Madrid in 1930. He acted as Reporter at the International Road Congress in The Hague this year. Mr. Kirkus is the author of "Railway Statistics their compilation and use" and in 1937 was awarded the Road Transport (Passenger) Medal by the Institute of Transport for a paper entitled "Road Transport Statistics."

Mr. C. E. Shaw, whose appointment as Assistant District Goods Manager, Birmingham, G.W.R., was recorded in our issue of October 21, joined the service at Reading in 1913, and for a number of years had experience in the District Goods Manager's office and the goods station offices in that town. In 1926 he began a four years' course of special training under the company's scheme, at the close of which he joined the staff of the Chief Goods Manager's office in charge of the statistical section. In 1933, Mr. Shaw was appointed Junior Assistant to the District Goods Manager at Birmingham, and twelve months later succeeded to the post of Chief Clerk to the Birmingham District Goods Manager, from which position he has now been promoted. Mr. Shaw, who is the author of several papers to the G.W.R. Birmingham Lecture & Debating Society and the Birmingham Section of the Institute of Transport, is also the lecturer in "Railway Salesmanship" in the Birmingham area.

Mr. E. D. Trask, whose appointment as Locomotive Running Superintendent, Scottish Area, L.N.E.R., was



**Mr. C. E. Shaw**

Appointed Assistant District Goods Manager, Birmingham, G.W.R.



**Mr. E. D. Trask**

Appointed Locomotive Running Superintendent, Scottish Area, L.N.E.R.



**Mr. J. Clayton, M.B.E.**

Personal Assistant to C.M.E., Southern Railway, 1923-38

recorded on October 14, began his career as a premium apprentice in the Great Northern Railway locomotive works at Doncaster under Mr. H. N. (now Sir Nigel) Gresley on September 19, 1911. He was associated with the Yeomanry and served with the Yorkshire Dragoons in France during the great war until 1917, when he was commissioned to the Royal Field Artillery. At the beginning of 1918 he transferred to the Royal Air Force as a Flying Officer, and remained in this position until the Armistice. Mr. Trask again took up his railway services at Ardsley (Leeds), and was subsequently stationed at King's Cross, Neasden, Liverpool Street (Headquarters), Grantham, and Peterborough. In February, 1935, he was promoted to be District Locomotive Superintendent, Gateshead, North Eastern Area, and in 1937 was appointed District Locomotive Superintendent of the combined districts of York and Leeds in the North Eastern Area, which he held until his present appointment as Locomotive Running Superintendent, Scottish Area.

Mr. James Clayton, M.B.E., M.I.Mech.E., who, as announced in our issue of October 14 will retire on October 31 from the position of Personal Assistant to the Chief Mechanical Engineer, Southern Railway, served his apprenticeship in the shops and offices of Beyer, Peacock & Co. Ltd. At the same time he studied at the Municipal School of Technology, and Owens College, Manchester. In 1899 he joined the former S.E. & C.R. as a locomotive draughtsman, and in that company's service rose to the position of Chief Inspector of Locomotives and New Materials. From 1903-04 Mr. Clayton served with the Motor Manufacturing Co. Ltd., Coventry, first as Chief Draughtsman and subsequently as Assistant Works Manager. In 1905 he joined the Midland Railway, at Derby, taking charge of the Investigation and Casualty Section of the Running Department, and from 1907-14 was Chief Assistant in the Locomotive Drawing Office. Mr. Clayton was in 1914 appointed Chief Locomotive Draughtsman, S.E. & C.R., becoming Personal Assistant to the C.M.E. (Mr. R. E. L. Maunsell) in 1919. On Mr. Maunsell's appointment as Chief Mechanical Engineer of the Southern Railway, Mr. Clayton continued as his Personal Assistant, and since November last year has been Personal Assistant to Mr. O. V. Bulleid, the present Chief Mechanical Engineer of the Southern Railway. Out of 90 classes of locomotives now running on the Southern Railway, 24 were designed and constructed under the supervision of Mr. Clayton, comprising 688 engines out of a total of 1791 now in service. Mr. Clayton is a Vice-President of the Institution of Mechanical Engineers, and a Past-President of the Locomotive and Carriage Institution.

Mr. F. W. Way will retire on October 31 next from the position of Docks Manager, after nearly fifty years' service with the Manchester Ship Canal Company.

Mr. Warren J. Bruce, Assistant Docks Manager, has been appointed as his successor, and will assume the duties of Docks Manager from November 1 next.

The Lord Chancellor has nominated Mr. Justice Wrottesley to be *ex-officio* Commissioner for England under the Railway and Canal Traffic Act, 1888.

#### PRESENTATION TO MR. J. R. MORRIS

At a large and representative gathering at the Queen Hotel, Chester, on October 22, a presentation was made to Mr. J. R. Morris, who recently retired from the position of Divisional Superintendent at Chester, G.W.R., which post he had held since 1922.

Mr. R. E. Lampitt, Assistant Divisional Superintendent, was in the chair, and he made reference to Mr. Morris's long and distinguished career with the company and particularly to his work in the Chester Division. Mr. Lampitt was supported by a number of speakers, including Mr. J. Williams, late Joint Railways Superintendent; Mr. Partington, Bibby Line; Messrs. T. Martin, G. Cornish and M. Roberts, who all testified to Mr. Morris's sterling qualities and the effective way he had carried out his duties.

Mr. Morris, in his reply, thanked all concerned for the presents, which he said both he and Mrs. Morris would always value and which would be a

constant reminder of the happy time he had spent with the Great Western Railway and the many friendships he had formed. Mr. Morris referred feelingly to the help and encouragement he had received from Mrs. Morris during his career.

The presentation took the form of a three-stone diamond brooch for Mrs. Morris, a silver centre-piece suitably inscribed, and two silver candlesticks. Letters of apology for non-attendance and expressing best wishes for Mr. Morris for a long and happy retirement were received from Sir Henry Robertson, Director of the company; Mr. S. J. Lister, Cunard White Star Limited; and a large number of business and railway friends and acquaintances of Mr. Morris.

We regret to record the death in Paris on October 22 of Sir Robert Mond. During his early years, Sir Robert collaborated with his father, Dr. Ludwig Mond, in discovering the gaseous metallic compound nickel carbonyl and in investigating its properties. This work led to the Mond Carbonyl process of refining nickel. As Chairman of the Mond Nickel Company in 1919, Sir Robert was primarily responsible for initiating the enterprise of separating and refining the platinum metals from the end products of the Mond Carbonyl Process. His many personal kindnesses and his tireless encouragement of young research and industrial workers will make his loss keenly felt in a wide sphere of scientific activity.

## European Timetable and Through Carriage Conference, Budapest

In consequence of the invitation given by the Royal Hungarian State Railways at the International Timetable and Through Carriage Conference held in Stockholm last year, the conference was fixed this year for Budapest and should have been held from October 3 to 8, inclusive, but owing to the international crisis, it was postponed for a week.

All the railways of Europe are parties to this conference, which is held every year in October to fix the services for the twelve months from the following May, and the Southern and London & North Eastern Railways are both specially interested in this conference, having regard to their Continental services.

The conference sessions were this year held at Budapest in the Mucarnok (Palais des Beaux-Arts), whilst the plenary session, at which all points of principle concerning the general assembly are discussed, took place at the Muegyetem (L'Ecole Polytechnique Royale). Over 420 questions were discussed this year, to the benefit of the travelling public as from next May.

Altogether 239 delegates attended the conference. The countries represented

were as follows (the number of delegates in brackets after each country): Belgium (18), Bulgaria (2), Czechoslovakia (13), Danzig Free City (1), Denmark (3), Estonia (4), Finland (5), France (23), Germany (58), Great Britain (7), Greece (3), Hungary (27), Italy (14), Yugoslavia (6), Latvia (1), Lithuania (2), Luxembourg (2), Netherlands (8), Norway (3), Poland (13), Portugal (1), Roumania (4), Sweden (6), Switzerland (15), Turkey (2).

This year there were seven British delegates. The Southern Railway was represented by Mr. R. H. Hacker, Continental Superintendent; Mr. R. E. Sinfield, Continental Department; and Mr. S. W. Smart, Assistant for Train Services. The London & North Eastern Railway was represented by Mr. A. L. Gibson, Continental Traffic Manager; and Mr. T. A. Smith, Head of Passenger Section. On this occasion the London & North Eastern Railway also undertook the representation of the London Midland & Scottish Railway, and the Southern Railway the representation of the Great Western Railway.

The conference next year will be held at Istanbul from October 2 to 7.



## Railway Officers' & Servants' Association Dinner

Mr. Robert Holland-Martin, Chairman of the Southern Railway, presided at the seventy-seventh annual dinner of the United Kingdom Railway Officers' & Servants' Association, which was held at the Trocadero, London, on Thursday, October 20. Among those present were the following:—

The Lord Cromwell, the Hon. R. G. Lyttelton, Sir Archibald Langman, Sir James Calder, Sir Sam Fay, Brig.-General F. D. Hammond, Colonel Miles Backhouse, Lt.-Colonel P. M. Brooke-Hitching, Mr. H. Leslie Boyce, M.P., Mr. Theodore Instone, Capt. Alfred Instone.

Messrs. D. Denis Williams (Henry Williams Limited), F. W. Tipton (Thames Steam Tug & Lighterage Co. Ltd.), J. Rollings Smith, J. A. Kay (Editor, THE RAILWAY GAZETTE), J. W. Porter (W. T. Glover & Co. Ltd.), T. Potter (Gloucester Foundry Company), D. R. Lamb, (Editor, *Modern Transport*), J. M. Robertson, John Reid (Dunlop Rubber Co. Ltd.), L. J. Cardew Wood (Bell's Asbestos & Engineering Supplies Limited), Gavin Cowper (Colville's Limited), H. Quennell (Messrs. Slaughter & May), J. W. Pritchard (Hadfields, Merton, Limited), A. W. Balne and S. R. Vizot (Carter Paterson & Co. Ltd.), E. Bezman (Wright's Ropes Limited), R. Gresley (Wilkes Limited).

*Southern Railway:* Mr. Robert Holland-Martin (Chairman), Mr. Eric Gore-Browne (Deputy Chairman); the Hon. Clive Pearson, Sir Charles L. Morgan, Mr. Charles Sheath (directors).

Mr. E. J. Missenden (Traffic Manager), Major L. F. S. Dawes (Secretary), Lt.-Colonel C. J. Francis (Stores Superintendent), Messrs. E. Stone (Registrar), H. E. O. Wheeler (Superintendent of Operation), W. J. England (Assistant Superintendent of Operation), E. F. E. Livesey (Development Officer), R. G. Davidson (Accountant), A. E. Moore (Audit Accountant), C. Gribble (Assistant Engineer), T. E. Brain (Assistant Secretary), K. M. Alexander (Birmingham), H. Barnden (Secretary's Office), T. E. Chrimes (Assistant Divisional Locomotive Running Superintendent), H. C. Greenfield (Stationmaster, Waterloo), J. Bridger (Stationmaster, Victoria), E. Card (Stationmaster, London Bridge).

*G.W.R.:* Messrs. H. A. Alexander (Divisional Engineer, Bristol), J. F. M. Taylor, G. E. R. Penney.

*L.N.E.R.:* Messrs. A. Gregory (District Passenger Manager, Liverpool Street), F. C. Wilson (District Superintendent, Stratford), E. F. Greenfield (District Superintendent, Norwich), Percy Syder (London City Manager), G. F. Lofting (Parcels Agent, King's Cross), H. R. Statham (District Goods and Passenger Manager, Norwich), H. C. R. Calver (Stationmaster, Liverpool Street).

*Officers of the Association:* S. Bolton (Treasurer), Albert T. Reynolds (Secretary).

Mr. R. Holland-Martin, in proposing the toast of the association, said he had accepted the chairmanship this year with alacrity, as his admiration for railwaymen and his appreciation of the work they did on behalf of the public were unbounded. Moreover, the public proved a difficult master and did not realise the difficulties and even dangers which railwaymen were confronted with in supplying efficient service—a task which called for a smiling face and no small amount of "humouring"; they were, moreover, inclined to forget innumerable grades of workers—particularly linesmen and permanent way men, on whose continued vigilance their safety depended. Charity of the nature provided by this association was of inestimable value to railwaymen, and the total amount in annuities, gifts, and grants, already exceeding £350,000, meant a tremendous lot to them, as the

payments in question stood between disaster and a modicum of comfort; the charity was not dependent entirely on voluntary subscribers, but received contributions from the men themselves, and it was particularly gratifying to know that the management was in the hands of men in railway service.

Mr. F. C. Wilson, in replying to the toast, referred appreciatively to Southern Railway enterprise and progress under the leadership of Mr. Holland-Martin, with special reference to the development of electrification and Southampton Docks, the centenary of which had recently been celebrated. He stressed the benefit of annuities and small pensions to retiring railwaymen, especially the older men, and spoke of the Sick Fund and grants made to those in distress, as in cases of retirement through ill-health; the association was managed by railway officers without fee or reward and never refused help to those in need, members or otherwise. He was pleased to express gratitude to two outstanding helpers of the association—Colonel C. J. Francis (Southern Railway) and Mr. Percy Syder (London & North Eastern Railway), and concluded by thanking the President and the whole company for their generous support.

Mr. R. G. Davidson proposed the toast of the visitors, which, he said, should be received enthusiastically owing to the presence of many illustrious representatives of commerce and industry, without whom such a gathering would not be complete. Their attendance was indicative of the interest taken in the association's welfare and he appreciated the very generous assistance from all, which was entirely responsible for the success attained. He concluded by coupling with the toast

the name of Brigadier-General F. D. Hammond.

Brigadier-General Hammond, in reply, opened in a light strain and then went on to speak of the objects of the association and the success achieved. He referred to the outstanding qualities of railwaymen—loyalty, *esprit de corps*, and pride in their job—which were more marked on British railways than anywhere else, and one way of discovering this, he said, was by going abroad. The association was instrumental in keeping that spirit alive and for that reason alone was worthy of support. Referring to various insurance schemes, he said that the association went one better by providing for that little extra comfort which meant so much, and he was sure that there would be no dissentient on that point.

Sir James Calder, in proposing the toast of the Chairman, referred to Mr. Holland-Martin's many interests in commercial, public, and philanthropic spheres, and also to the very great willingness and pleasure with which he had supported the cause of the association. So many people in these days talked glibly about responding if they had a proper lead, but this could not be said about the Chairman, who had himself provided the lead and was always happy to help, by charitable means, railwaymen suffering from illness, the effects of accidents, and so forth.

The Chairman in a brief reply spoke of the delightful evening they had all spent and the help they had been enabled to afford to a charity which they all had so much at heart; gratitude was especially due to the Secretary of the association, Mr. Reynolds, and his staff for the hard work they had put in.

In the course of the evening Mr. S. Bolton, the Treasurer of the association, announced the sum collected this year, amounting to £1,468.

## Institute of Transport Meetings, 1938-39

The inaugural address for the twentieth (1938-39) session of the Institute of Transport was delivered by the President, Mr. Gilbert S. Szlumper, on October 10, and reported in our issue of October 14. Further ordinary meetings will be held on November 14 (paper by Mr. A. C. Hardy, B.Sc., on "Cross-channel services from the passenger viewpoint") and on December 12 (annual general meeting, followed by paper by Mr. S. H. Fisher on "Acceleration of railway services").

Papers to be read at ordinary meetings next year are: January 19: "Passenger transport by road in relation to railway services" (Colonel A. S. Redman); February 13, "Inter-availability of tickets by rail, road, sea, and air" (Mr. J. C. Chambers); March 13, "The London Passenger Transport Board, 1933-38" (Mr. Frank

Pick); and April 3, "The four incidents of a railway electrification scheme" (Mr. W. J. England).

Lectures and informal meetings will be held on October 18 (lecture by Mr. C. Bentham on "The transport of the grain harvests of the world"); November 29 (Brancker Memorial Lecture), Capt. D. O. Lumley on "Development of the Air Mail"; and December 20 ("Some aspects of research in a commercial undertaking," by Mr. D. Lemon). Informal meetings for 1939 are: January 17, "Railways and the trader" (Mr. A. Hastie); February 21, "Operation and control of a road haulage undertaking" (J. S. Nicholl); March 21, "Responsibility of a railway for a delay, should it be made more precise?" (E. D. Brant); and April 18, "Indian railways: an outline of their history and development" (L. H. Korkness).

## Folkestone Harbour Station Improvement, S.R.

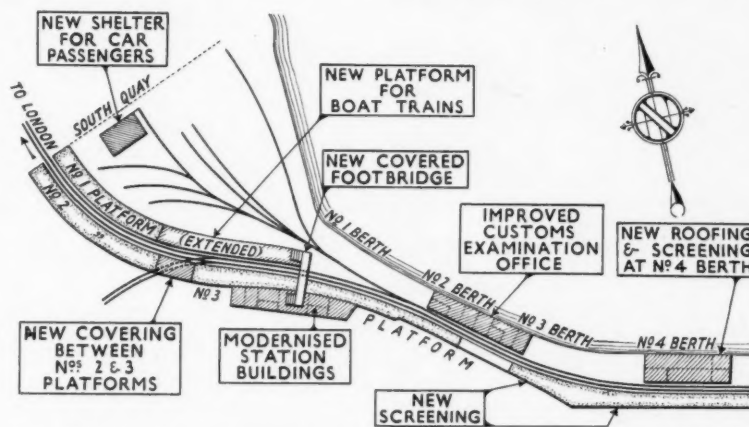
Folkestone Harbour station, the subject of criticism during recent years, is to be greatly improved at a cost of between £40,000 and £50,000. One feature of the improvements alone—the lengthening of No. 1 platform from 308 ft. to 700 ft.—will save delays to passengers of 40 min. occasionally arising now that only two boat trains can be dealt with in the station at one time. The most important feature, however, is that passengers will be practically always under cover when transferring between train and boat.

On No. 2 berth, the one generally used for the mail steamers, the new scheme will provide complete protection for passengers. No. 4 berth, used for relief and excursion steamers, also for ordinary passenger services during the period of strong easterly winds, and when No. 2 berth cannot be used, will be provided with additional covering 110 ft. long, where embarkation and disembarkation take place; also a long glazed screen alongside No. 4 platform, to protect against wind and rain. The lighting on the pier will be improved. A boat train of full length occupies the whole of Platform No. 2 and part of No. 3, and it is necessary for passengers to cross the exposed

portion between the two platforms. Additional roofing will therefore be erected over the open space, together with back screens where practicable.

A covered footbridge will be provided between Nos. 1 and 3 platforms, and the whole of the No. 1 platform extension and the portion of the existing platform which is uncovered will be covered in.

A shelter is being provided on the South Quay for the use of passengers travelling with their cars to and from the Continent, while their cars and baggage are being cleared by the Customs. The station buildings will be attractively modernised, on the lines of similar schemes already carried out at many Southern Railway stations, with improved lighting, modern furniture, and bright, up-to-date refreshment rooms.



Details of improvement scheme for Folkestone Harbour station

## STAFF AND LABOUR MATTERS

### Railway Shopmen

The Industrial Court sat on October 17 to determine the claim of A. Marson, employed by the Southern Railway Company as a Grade II Fitter in the Engineer's Department at Tonbridge, for regrading as Fitter, Grade I. The workman concerned is employed as a locking fitter. In support of the claim evidence was given by the National Union of Railwaymen as to the quantity and quality of the work Marson is called upon to perform and it was submitted that having regard thereto, his claim to be regraded as Fitter, Grade I, is fully justified. As against the claim the company urged that in view of its practice in regard to the grading of locking fitters and of the provisions of Award No. 728 Marson was properly graded as a fitter, Grade II, and that accordingly the claim made on his behalf should not be conceded. Reference was also made to the observations of the Court in Award No. 1,083 in regard to the upgrading of signal fitters.

The provisions of Award No. 728 of the Industrial Court are applicable to the employment of the man concerned. That award does not provide specifically for locking fitters as a class and Marson has been graded by the company as a fitter, Grade II, in accordance with the provisions of Note I of Schedule "B" to Award No. 728. The Court by Award No. 1,712, dated October 20, decide against the claim but

state that its decision is not to be regarded as debarring the company from dealing with the matter, should it desire to do so, in accordance with the provisions of paragraph 29 of Award No. 728, which provides *inter alia* that "the rates set out (in the Award) are not intended to prejudice the position of men possessing special qualifications or skill, or employed under conditions recognised by the management as entitling them to rates higher than those normally payable."

### Wages in Eire—Great Southern Railways

Since the rejection by the National Union of Railwaymen, the Associated Society of Locomotive Engineers & Firemen, and the Railway Clerks' Association of the claim of the Great Southern Railways for a deduction of 7½ per cent. from the wages of clerical and general workers, the matter has been referred to the Irish Railway Wages Board and the hearing of the case began in Dublin on Wednesday, October 26.

On October 20 an application was made in the High Court, Dublin, before Mr. Justice Johnston on behalf of the National Union of Railwaymen and its members, who are plaintiffs in two summonses against the railway company, asking for declarations that the plaintiffs are entitled to have observed the terms of an agreement made between the union and the company which dealt

with the rates of pay and hours of work of certain employees. Mr. Lavery said that two classes of employees were concerned: Those concerned in the road transport business of the railway company at the Broadstone works, and those employed in the railway shops. The purpose of the application was to ask for an interim injunction or, in the alternative, liberty to serve notice of motion for an interlocutory injunction to be heard at an early date, and when the railway company could be represented. The matter, he said, was one of considerable urgency, because the railway company had notified the union that in the road transport case the altered hours of work and working conditions would come into force on Saturday, October 22. Mr. Justice Johnston said that he would give liberty in both cases to serve a short notice of motion for Tuesday, October 25, for the purpose of asking for an interlocutory injunction that would give the railway company some time to consider the position.

**BRITISH TIMKEN DINNER.**—The annual dinner of British Timken Limited was held on Tuesday, October 18, at the May Fair Hotel, London, under the chairmanship of Mr. F. J. Pascoe in the absence of the chairman of the company, Mr. M. B. E. Dewar, through indisposition. This popular event was attended by Timken representatives from Great Britain and abroad, and by their numerous guests.

## Aldgate East New Station

### Special traffic arrangements on Sunday

Aldgate East station will be closed all day next Sunday (October 30) to allow the lowering of the permanent way by 7 ft. to make room for two new ticket offices being built between railway and road level. The work of the last two years has consisted of widening the existing station tunnel from 50 ft. to 70 ft. to carry four railway tracks instead of two, and the construction of a new Aldgate East station—double-ended and with four entrances—east of the existing station, or immediately below the junction of Aldgate High Street and Commercial Street. This is the first time it has been necessary to suspend traffic for

a considerable period since the work began.

The tracks for a length of about 1,400 ft., are at the moment supported on a wooden trestle, which represents the level of the old tunnel, now enlarged. The engineers will have possession of the line from after the last train on Saturday night until very early on Monday morning. The tracks will be slung from the roof on eye-bolts, the trestles and steel joists, forming the wooden viaduct, pulled away, and the tracks lowered to their permanent foundation 7 ft. below. They will join the other sections of the permanent way with a gradient

of 1 in 50. At the same time, the temporary platforms and staircases at Aldgate East will be removed, and the new booking office floor completed.

Aldgate East is a vital centre for the whole of the Metropolitan and District Lines, and this work will have repercussions at almost every station on both lines. It will mean an increase in passenger accommodation on the Metropolitan Barking line of 33½ per cent. It will enable 38 eight-car District Line trains to be run every hour, and the length of Metropolitan trains to be increased from six to eight cars. Special buses will supplement the ordinary road services on Sunday between Whitechapel and Aldgate, the points at which trains from Barking and Upminster, and from Ealing, Richmond, Wimbledon, and Hammersmith will terminate.

## Institute of Transport: Metropolitan Graduate and Student Society

On Tuesday last a reception was held at the Institute of Electrical Engineers, Savoy Place, London, by Mr. Gilbert S. Szlumper, General Manager, Southern Railway, and President of the Institute of Transport. The occasion was the inaugural meeting of the winter session of the Metropolitan Graduate and Student Society, the junior section of the institute. A full attendance of members was present, including several members of the institute council, the Secretary, Mr. Winter Gray, and others.

At the subsequent meeting, Mr. F. White devoted a few words to outlining the purposes of the society, of

which he is Chairman, which he said showed at present the satisfactory membership of nearly 400.

Mr. Szlumper gave a short, informal and entertaining address which consisted chiefly of advice, hints, and suggestions to the students. He hoped that all would further the worthy purpose of the society by giving it the fullest possible measure of support; and, noting the preponderance of railway students on the membership list over those occupied in road and air transport, he urged that all should try to broaden their outlook by attending meetings and hearing papers on each other's subject.

Emphasising the necessity for hard study in the search for greater and wider knowledge, Mr. Szlumper paid tribute to the expert assistance available in the technical press, which he said had been, and was still now, of the greatest value. The speaker also recommended the study of legal cases as a means of developing a clear and analytical mind.

Dealing in conclusion with the relationship between employer and labour, Mr. Szlumper stated that anything one could do to get to know better the texture and dimensions of the working man's mind should never be neglected. A hearty vote of thanks to the President for his address was proposed by the Chairman and the society and carried with acclamation.

## Institute of Welding Dinner

The second annual dinner of the Institute of Welding at Grosvenor House, London, on Wednesday, was presided over by Sir William J. Larbe, the President.

Sir Frank Smith, Secretary of the Royal Society, proposed the toast of "The Institute of Welding," and referred to the tremendous increase in the welding industry during the last few years. Welding was commonly used in over 200 different industries, and it had been calculated that nearly 500,000,000 cu. ft. of oxygen was consumed each year in this country in welding plant and that the amount of wire used for welds would girdle the equator several times.

After mentioning some of the improvements effected by welding, particularly in regard to quieter travel on the London tube railways resulting from long welded rails, the speaker referred to the recently published report of the Welding Panel of the Steel Structures Research Committee, as a direct consequence of which a committee of the institute had undertaken

to prepare draft building bye-laws and a code of welding practice. The growth of welding all over the world depended largely on the application of scientific knowledge, and the recent re-organisation of the institute supplied ample evidence that the British branch of the industry was alive to the importance of research. Welding enabled the most to be got out of many of the new materials which the science of metallurgy was producing today, and in congratulating the welding industry upon the contributions already made to national welfare and comfort, the speaker concluded by wishing the institute continued success.

Sir William Larbe, responding to the toast, stated that the past year had witnessed substantial progress. The number of members had reached a total of 1,300, and the demand for the formation of new local branches and discussion centres was such that special provision had been made in the organisation to provide the means of collating experience, stimulating research, and disseminating knowledge.

The institute, through its research organisation, was working on a variety of new problems, metallurgical as well as mechanical, and in this work had received the co-operation of the principal universities, the Institute of Naval Architects, the Institution of Engineers and Shipbuilders in Scotland, the Shipbuilders' Conference, and others. Whether in accelerating the armament programme, or in the increased competitive power of industries at home and abroad, the institute had an important national rôle to play, and one, the speaker was convinced, that it could discharge effectively.

Sir William Larbe also proposed the toast of the guests, coupled with the names of Sir Frank Smith and The Hon. Mr. Justice Langton, to both of whom he referred in eulogistic terms.

**ELECTRIC SIGNALLING AT SARGANS, SWITZERLAND.**—In the report in our overseas news section for October 14, page 637, the name of the makers of the electric signal installation at Sargans, Switzerland, was incorrectly given. It should have been Signum A.G., Wallisellen, Zurich.



# MINISTRY OF TRANSPORT ACCIDENT REPORT

Between Charing Cross and Temple, District Line,  
L.P.T.B., May 17, 1938

At about 9.55 a.m. the eastbound Inner Circle train No. 59 ran into train No. 21, Ealing to Barking, standing at automatic signal No. 823 between Charing Cross and Temple. Telescoping took place between two cars at the rear of the Barking train, the rearmost mounting the underframe in front and penetrating the body about 15 ft., its top coming in contact with the tunnel roof girders. The greater part of the energy of impact was so absorbed. There was a certain amount of damage to glass draught screens and windows. Structural damage in the colliding train was trifling. Six passengers were killed or died in hospital shortly after the accident; 43 passengers and two trainmen were injured or complained of shock. An officer of the board received electrical burns shortly after the collision.

There was no avoidable delay in rendering assistance, the first injured passenger reaching hospital at 10.30 a.m., but the difficulties of the situation made the work of freeing entrapped passengers slow. Steel car panelling had to be cut away and the car in contact with the roof forced further up by jacks to free passengers pinned below its underframe. The last of the injured was not released until 12.30 p.m. Except in the telescoped carriages lights continued to burn, as current remained on, but the westbound line was made dead at 10.20 a.m. to facilitate rescue work. A fallen steel panel caused violent arcing about 3 min. later and current was cut off the eastbound line, preventing trains being moved up for passengers to walk through. This, and absence of lights, delayed completion of detrainment of uninjured persons until 11.0 a.m.

Lieut.-Colonel E. Woodhouse conducted the inquiry. (The accompanying diagram illustrates the lines, signals, track circuit sections and other details involved in the case.)

The line is worked on the 600-volt d.c. third and fourth rail system, with automatic track circuit signalling, combined with train stops. At Charing Cross there is a signal cabin, designated as "E.H.," used only on certain occasions when trains are reversed there; this was closed at the time, with king lever reversed, the signals working automatically. Normally the train stop at one signal must rise to the operative position before the signal in rear can clear again. Current cut-off wires are provided along the tunnel walls, controlling the two lines as far as Mansion House; the latter are fed from Charing Cross substation.

The trains had Westinghouse quick-acting brake, central buffing and draw-gear. The Barking train had vertical plane side locking couplers, and the Inner Circle train buckeye couplers. They had no emergency battery light-

ing, such as exists on the tube trains, and each carried a single oil tail lamp.

## Origin of the Accident

The cause of the accident was a "false clear" signal indication. Eastbound starting signal E.H.9, Charing Cross, was able to show clear as soon as the first track circuit section ahead of it was clear, owing to a wrong connection made during the previous night in the course of minor alterations to wiring. Examination of the wiring after the accident by Mr. W. S. Every, Signal Engineer, and Mr. R. Dell, Assistant Signal Engineer, showed that a wire from a circuit breaker on the king lever, No. 8, had been attached to the bottom right-hand, instead of the centre, terminal in a circuit breaker on lever No. 9 controlling the starting signal. With No. 8 reversed and the cabin closed this provided an alternative path, the effect of which was to cut out the control which should have been given by track circuits G and GG over the green aspect of the signal, allowing it to appear too soon. The proving of the train stop at the signal in advance, No. 823, was similarly cut out.

The original d.c. track circuiting on the line, installed when it was electrified, is being replaced by alternating current apparatus and this had been done at Charing Cross on the night of May 7 and 8, when a new relay room was brought into use. Tidying and cleating new cables remained to be done, but all controls were tested at this time and found correct by Chief Signal Inspector F. Baker. The mistake must therefore have been made subsequently. The wiring was not touched again until the night before the accident, when a gang worked at and near Charing Cross under Chief Lineman A. G. Beer. Only one man, Signal Installer E. Eeles, worked in the cabin itself. Beer had been in charge of the alterations for seven or eight weeks. Constant supervision was generally necessary, especially as the men engaged had not worked under him for long, but Eeles had been with him since the alterations began; he did not hesitate to allow him to tidy the relay room and cabin wiring without supervision. He knew what Eeles would be doing and did not think he could make a mistake; the new wiring was all labelled and the temporary connection between Nos. 8 and 9 circuit breakers, due to be replaced, was there to guide him. Eeles told him, about 5.0 a.m., that everything was correct. He admitted he ought to have tested Eeles's work, being aware of the rule on the subject, but it did not occur to him that a mistake could be made in such straightforward work. A test would have been a simple matter, and even without it watching the illumi-

nated diagram would have revealed the fault.

## Wiring Alterations

Installer Eeles said that, among other work, he replaced a temporary braided wire between circuit breakers Nos. 8 and 9 by a lead-covered one. He had plenty of light to work by and was certain he unscrewed only one terminal at a time, his regular practice. He felt sure he left the connections exactly as he found them. The attachment of the new wire from No. 8 in No. 9 circuit breaker was the last one he made before finishing work at 5.0 a.m. He was not hurried in any way. He said that Beer looked in once or twice during the night, but the latter did not recollect doing so.

An unsatisfactory feature of the case is that although a motorman noticed signal E.H.9 clearing wrongly at about 9.37 a.m., 18 min. before the accident, and reported it at Temple station, no action was taken to warn following trains to run with extreme caution; other motormen made similar reports, the last a few seconds before the accident. The first one, Longley, of train No. 53, saw a tail light at no great distance ahead immediately after leaving Charing Cross; he stopped, then ran slowly to Temple, where he whistled for the staff and said to Foreman Foskew, "Get on to Charing Cross at once; tell them their starting signal has failed in the 'off' position for me." Foskew (who had had a telephone message delivered to him by his porter Hopkins from Inspector Barnes at Charing Cross asking why Longley had stopped suddenly) said, "They wondered at Charing Cross why you had stopped," but Longley did not tell him he had nearly run into a train. Guard Blake heard this conversation. Six other trains passed and then Motorman Butler, train No. 24, on entering Charing Cross, thought signal E.H.9 cleared very quickly and later, seeing a train only just beyond signal No. 823, whistled at Temple and told Foskew "there was something wrong with the Charing Cross signals, as the starter seemed to come off too quick." Foskew replied that he would telephone about it. This was at about 9.50 a.m. Foskew denied having been told by Butler that the next train was "six or eight car lengths in front." Two further trains passed without event. Then Motorman Read, train No. 52, who nearly struck the train in front, in rear of signal No. 823, reported the fact to Foskew who said he had reported the matter and had similar complaints already. Motorman Berry, train No. 34, saw Longley (returning from Mansion House) signalling to him, and then caught sight of a tail light moving slowly away a short distance off. He reported this to Foskew, who said Charing Cross had the matter in hand.

Motorman Holbourn, of the next

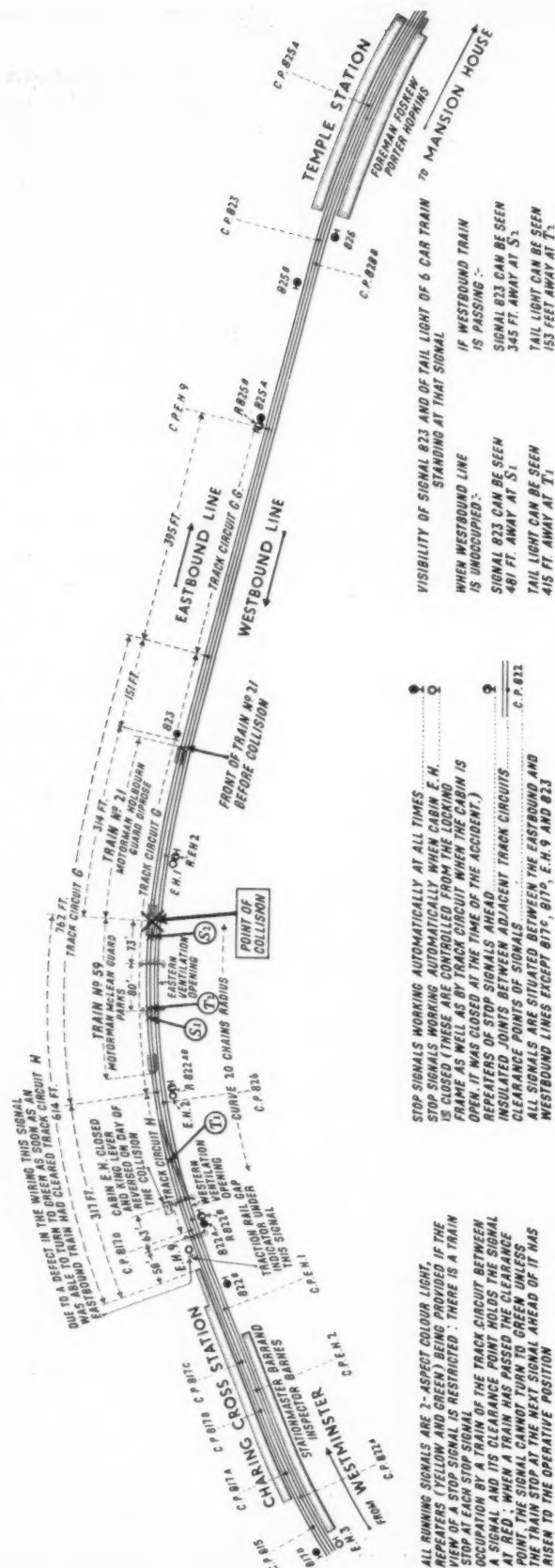


Diagram illustrating the signalling and other circumstances concerned in the fatal collision on May 17, 1938, at Charing Cross (District line) L.P.T.B., the first collision in which a passenger has been killed on that line since January 29, 1876, when an accident occurred just west of Earls Court

train, No. 21, saw a tail light nearer to him than signal No. 823 and stopped at once, then drew up to the signal. Releasing the brakes ready to move he was thrown down by the collision. He relit his lamp, got down, and stopped westbound train No. 39, which he saw leave Temple.

Guard Diprose, who was seriously injured, supported this evidence. He said the tail lamp was burning properly at Charing Cross. He travelled from there in the rear motorman's compartment and, after his train stopped at signal No. 823 saw the Inner Circle train, No. 59, approaching, 70 yd. off, at normal speed. He saw the motorman release the deadman's handle and turn round to shield his head. The collision followed. He had a vague recollection of a westbound train passing but was not certain about it.

Motorman McLean, of the Circle train, began to look for signal No. 823 before reaching the eastern ventilation opening (see plan) but could not remember whether a westbound train passed just then. He had no clear recollection of seeing the tail light of train No. 21 and had no idea anything was wrong until, passing the patch of daylight, he perceived a "hazy red object." Realising it was the end of a train he released the deadman's handle and turned to avoid being crushed by the hand brake wheel.

Guard Parks, badly shaken by the collision, saw train No. 49 come up to within a few yards. This was driven by Motorman Mead, who heard a loud report from the substation on stopping at Charing Cross and saw the "gap indicator" under signal E.H.9 light up. This had gone out and the signal had cleared when he received the signal to start. Being suspicious he moved slowly and had no difficulty in stopping clear of train No. 59.

Special experiments, during which Colonel Woodhouse and Motorman McLean rode together in a driving compartment, showed that a reasonably good tail lamp on a six-car train standing at signal No. 823 became visible at 415 ft. A westbound train would, however, prevent it from being seen there, and the light would then become visible at 153 ft. With the train ahead sent away, signal No. 823 was seen in the mouth of the tunnel beyond the eastern ventilation opening on the same level as that previously occupied by the tail light; the brilliance of the two lights was approximately the same. On the plan are marked the four points, established by observation, at which the tail light of a train at signal No. 823 and the signal itself become visible, with the westbound line clear and occupied.

Motorman Longley, returning from Mansion House on train No. 53, saw No. 52 standing at signal No. 823 and, shortly afterwards, No. 34 leaving Charing Cross. He signalled to its motorman, Berry, to indicate some

thing wrong ahead. He found Inspector Barnes waiting for him and said, "Look! The signal is still doing it, failing in the off position." He also told him he nearly collided with a train when going eastward and Barnes said he would "see to it." He did not remember seeing eastbound train No. 21. It was not in the station when he got there nor did it enter while he was talking to Barnes. It did not occur to him to warn further motormen. Evidence was given by other motormen and guards regarding trains that passed them.

### The Telephone Messages

Stationmaster Barrand and Inspector Barnes, Charing Cross, noticed train No. 53 stop just after leaving. The latter telephoned to Temple, instructing Porter Hopkins that the motorman was to be asked why. A little later Hopkins telephoned that the motorman said, "The signal was on," and, on being asked "What signal, and what does he mean?" reiterated "That's what the driver says." Barrand and he then thought Longley had mishandled the controller on seeing signal No. 823 red and decided to question him on his return. These circumstances were reported to Assistant Controller Peters, Earls Court.

At about 9.51 a.m. Barnes received the meaningless message from Hopkins that the eastbound starting signal was "working sluggish." Foreman Foskew was on the eastbound platform at Temple, Hopkins on the other, where the telephone was. Going to speak to Longley, as requested by Barnes, he was told to "get on to Charing Cross and tell them their starting signal has failed in the off position." Longley made no mention of having escaped a collision. Foskew called across to Hopkins to telephone and was certain he used the words "failed in the off position," but the latter heard imperfectly or misunderstood, being certain Foskew said "on position," completely reversing the intended message. Ten minutes later, on receiving a similar report from Motorman Butler, train No. 24, he again called to Hopkins, but could not remember the exact words used.

Hopkins said he was told to ask Charing Cross "why nothing had been done, because trains coming in were still reporting the same defect," but admitted he said "the drivers are reporting that the signal is working sluggish"; he could give no reason for making this alteration. Foskew maintained that the first time he heard a collision had been narrowly averted was when train No. 52 (Motorman Read) arrived, shortly before the accident. He told Hopkins to pass this information on, but the latter merely said that motormen were still complaining that the signal was not working properly. This message was not received by Barnes, but was in any case too late.

Although aware of the seriousness of a signal failing at "off," Foskew did not inform the Controller. He admitted

he ought to have, when Longley reported to him, but thought Charing Cross, who had initiated the inquiry about Longley stopping, would also take action with the Controller. His excuse for not telephoning personally, despite successive reports about the signal, was he did not want to leave the then busy eastbound side of the station. He thought Hopkins capable of transmitting messages correctly and did not suspect, in spite of Motorman Butler's report later, that the first message to Charing Cross might have been misinterpreted or wrongly worded. As a result the first authentic information reached Inspector Barnes at about 9.52 a.m. when Longley returned. Up to then he had supposed Hopkins to be referring to signal No. 823 but, as soon as he fully understood the position, went and telephoned to the Controller; his conversation lasted no more than 15 seconds and he rushed to the eastbound platform to warn trains, stopping a few seconds to tell the stationmaster. He formed the conclusion that the "false clear" reported by Longley must have been temporary. There was no eastbound train in when he finished speaking to Longley and telephoning. He could get across the bridge before one arrived and inferred that No. 59 left while he was talking to Longley.

Assistant Controller Peters thought it was at least half a minute, possibly a minute, before he was free to attend to Barnes's call and recorded its time as 9.54½ a.m. He told Barnes to go over at once and "keep the signal under special observation." An attempt was made to instruct the stationmaster to open the cabin and bring the signal under manual control, but no reply could be got for some time.

### Switching off the Current

The board's rule on switching off traction current in emergency reads:—

"242.—(a) When serious arcing or fusing occurs on a train or in the cables supplying the current rails or in the connections thereto, current must be switched off to enable the defect to be remedied. Current must also be switched off when a derailment or collision has occurred if there is risk of arcing between the current rails and the cars."

There being no sign of arcing immediately after the accident, Motorman Holbourn did not then use the tunnel wires and, later, trains were moved up to the spot to simplify detrainment of passengers. Mr. G. Yorke, District Superintendent, Northern Line, who was severely burned, gave particulars of the arcing which later took place. A violent arc started close to his feet, caused by a piece of panelling touching the negative and running rails, and lasting, some thought, for 15 sec., till current was cut off the eastbound line at 10.23 a.m. due to Holbourn and others using the tunnel wires.

The Outdoor Superintendent, Mr. G. Webb, stated that a slight fire was

started by this arc but he had no difficulty in putting it out with an extinguisher. To facilitate the movements of ambulance men and helpers he had had the westbound line cut off at 10.20 a.m.

### Inspecting Officer's Conclusions

The statement of Chief Signal Inspector Baker as to tests on May 7/8 being unhesitatingly accepted, the mistake in the wiring must have been made by Eeles, though it is difficult to understand how, in face of his assertion that he never removed more than one terminal screw at a time; possibly he pulled the temporary braided wire off the centre terminal and, after replacing it by a lead-covered length, connected it later when the right-hand terminal had been removed. Whatever the true explanation, he must bear responsibility for the mistake. He is 36 and had been employed by the board for a year. As he was not competent to test the signal controls, Chief Lineman Beer should undoubtedly have done so; in accordance with recognised practice; though he believed Eeles conscientious and capable of a straightforward task, it was clearly his duty, as responsible man in charge, to satisfy himself that safety was unimpaired. It would have taken only a few minutes to make a test that would have revealed the mistake. Though in no sense deliberate, the omission was the primary cause of the accident, for which Beer must bear a large share of responsibility. He is 31, with 12 years' service and a good record.

That the tail lamp of train No. 21 was alight may be accepted, but McLean could not remember whether he had seen one or not. It is clear that westbound train No. 19 passed just before the collision; hence view of the light was restricted to 153 ft., covered in a little over 4 sec. at 25 m.p.h. Had McLean immediately realised it was a tail light in front, emergency braking might have stopped the train within the available distance or made the impact trifling. His failure to brake instantly is considered to be due to his confusing the light with signal No. 823, as Motorman Read had done a little earlier. A moment's hesitation was not unnatural and his statement that he became aware of the train only on re-entering the tunnel is accepted. He can be relieved of all responsibility.

Perhaps the most regrettable feature is the failure of the traffic staff to take preventive action, for which there was ample opportunity. Had Foskew carried out the instructions he received he would have learnt from Longley that a collision nearly took place; in any case he ought to have realised the serious implication of the information about signal E.H.9 and might have been expected to assure himself that the message reporting it was sent correctly. It is surprising he did not telephone himself. If he had to employ Hopkins, comparatively inexperienced, he ought to have made certain he understood



what to say. His excuse for not leaving the platform is extremely feeble. Personal attention, 10 min. later, when Motorman Butler spoke to him, would probably have averted the accident, but he contented himself with the same unreliable channel, without asking Hopkins how he phrased the earlier message or if it was understood. Even a third report from Motorman Read failed to rouse him to vigorous action. He must share responsibility with Beer; indeed his negligence is more serious, for on none of the three occasions when a dangerous failure was reported did he trouble to follow it up personally, or assure himself that remedial measures were being taken. He is 45, with 19 years' service, 13 as Station Foreman, with a good record. In justice to him, it should be added, he showed commendable initiative in organising and conducting rescue work.

Hopkins may have misunderstood what Foskew first told him to telephone, confusing "off" and "on," but had no excuse for garbling the second message and is deserving of some blame for his carelessness. He is 29, with 12 weeks' service and 6½ months in 1937.

Inspector Barnes cannot be criticised for what he did before Longley returned. Unfortunately he did not insist on speaking to Foskew when he got a more or less unintelligible message from Hopkins, but with eastbound traffic running smoothly his decision to wait until he could speak to Longley was not unreasonable. Colonel Woodhouse is not satisfied that he acted with equal promptitude when he learnt the true state of affairs. Had McLean been warned to drive cautiously the accident would not have happened. From a consideration of the evidence of various motormen, and calculations based on train running and signal spacing, Colonel Woodhouse concludes that Barnes had ample time to warn McLean, had he acted at once without speaking to the Control Office; his contention that no time was lost in crossing to the eastbound platform is not accepted. He apparently did not realise the dangerous possibilities of the situation and seems to have been slow in readjusting his ideas. His statement that he thought the false clear failure of signal E.H.9 might have been transitory, affecting Longley's train only, hardly bears examination. He had received the second message indicating that some failure, whatever its nature, still persisted. Moreover, no warning was given to Motorman Mead who followed McLean. Barnes could have prevented the accident but failed to rise to the unexpected situation in a manner to be expected of a man in his position; he must bear some share of the responsibility. He is 45, with 28 years' service, 11 as Station Inspector, and an excellent record.

The motormen of eastbound trains concerned are all to be commended for alertness, and Holbourn's promptness in stopping train No. 39 and later cutting off the current calls for remark, as

does Mead's caution after leaving Charing Cross, but for which a second collision might have occurred.

#### Remarks and Recommendations

This accident is an unwelcome reminder that apparatus taking the place of an operator, or guarding against his mistakes, correspondingly increases the maintainer's responsibility. The more elaborate the signalling system, the more essential is scrupulous care in installation and maintenance, and particularly in testing after an alteration, however trifling. This lesson is one of general application.

The omission of two senior members of the station staff to take immediate action suggests it is not sufficiently recognised that on an automatically signalled system, with relatively few signalmen, platform and station staff duties extend beyond marshalling of passengers and expeditious despatch of trains, and include responsibilities in connection with safety. All concerned should be reminded of this. The relevant portion of Rule 81 (n), covering a detective automatic signal, reads:—

"Except in the case of an automatic signal failing in the 'danger' position, the signalman at the box in rear or the stationmaster at the station in rear must be informed of the circumstances, and he must stop all trains proceeding toward the signal concerned and advise the drivers accordingly."

Strict and immediate compliance with this would have prevented the accident. The board should amplify it to make it perfectly clear there must be no hesitation in warning motormen if any suspicious or irregular behaviour of a signal is observed or reported.

The board's rule on the subject of switching off traction current is adequate under present conditions. The ability to move trains up to facilitate detrainment from a disabled one is a matter of convenience, not to be too highly rated, but maintenance of lighting after an accident or during a long hold up is important for the avoidance of panic and current should be kept on, if consistent with safety. The arcing in this case was fortuitous; had it not occurred, suggestions that current ought to have been switched off at once would probably not have been made. It has, however, been decided to instal lighting in the District and Metropolitan Line tunnels, similar to that on the tube lines, switched on automatically when the traction current is cut off, and the circumstances in which the latter is to be done should be reconsidered when the work is completed.

Surprise has been expressed at the use of an oil tail light on the board's sub-surface lines. A fixed electric tail light would be a simple matter to fit, although an oil lamp would have to be used as well, as a precaution against failure, but this entails a risk not immediately obvious. If a motorman, running cautiously in an emergency in a section which is or may be occupied, expects to find a brilliant tail lamp

on the train ahead and a train is standing with its lights out due to a defect, the oil light may not be noticed, with disastrous results. The tail light was adequate in the present case but, as had occurred a few minutes previously, was confused with a signal light. A method of marking the rear of a train, immediately recognisable as such, is therefore required; for preference the light should be independent of the traction supply. This matter, under consideration with the board for some time, is being investigated afresh and is of considerable importance. The tail light is the last defence of a stationary train when other protection has failed.

Except in the telescoped cars, most injuries appear to have been due to broken glass. Draught screens and end windows were broken by passengers thrown against them. Passengers in longitudinal seats nearest the doors are very close to draught screens. It is desirable that all transverse glass be of the safety variety, laminated or toughened; it has been decided to substitute such glass by degrees for the plate glass in existing stock.

It would not be economically practicable to equip existing District and Metropolitan stock with secondary batteries and low voltage emergency lighting, as in tube trains. Extensive rolling stock renewals for these lines were authorised some time ago. Deliveries are now being made; the new cars have steel bodywork almost exclusively, improved couplers affording security against vertical disengagement, and headstocks that reduce risk of overriding. The end doors have been constructed to be unlikely to jam through floor buckling. All transverse glass is of the safety variety. Lighting is low voltage, from a motor-generator, with secondary batteries able to keep a portion of the lights burning for a considerable time after traction current is cut off. There are twin electric tail lamps fed from the train lighting circuit, and thus able to remain alight on a train stopped with its traction wiring dead.

Several witnesses commented on the absence of panic after the collision, even after lights were extinguished, and maintenance of the lighting as long as possible doubtless contributed to this.

#### Forthcoming Meetings

Nov. 1 (Tues.).—Buenos Ayres & Pacific Railway Co. Ltd. (Annual), River Plate House, Finsbury Circus, E.C.2, at 11.30 a.m.

Nov. 2 (Wed.).—Bahia Blanca & North Western Railway Co. Ltd. (General), River Plate House, Finsbury Circus, E.C.2, at 2.15 p.m.

Nov. 2 (Wed.).—Buenos Ayres Western Railway Limited (Ordinary General), River Plate House, Finsbury Circus, E.C.2, at 12 noon.

## RAILWAY AND OTHER MEETINGS

### South Indian Railway Co. Ltd.

The annual general meeting of the South Indian Railway Co. Ltd. was held at 91, Petty France, Westminster, on October 26, Sir Ernest A. S. Bell, Chairman and Managing Director, presiding.

The Assistant to the Managing Director (Mr. C. A. Worsfold) read the notice convening the meeting and the auditors' report.

The Chairman, in moving the adoption of the report and accounts, said that he wished to refer to the death of Sir Vivian E. D. Jarrad, a Director of the company. Sir Vivian's greatly regretted death occurred only a few months after he had been chosen, at the last general meeting, to fill the vacancy on the board caused by the death of Mr. Thomas Wake. To fill this new vacancy the board had appointed Mr. Percy H. Mafin, O.B.E., M.C., a gentleman who had much experience of Indian railway matters and working, particularly in connection with H.E.H. The Nizam's Guaranteed State Railways. Mr. Mafin would shortly be leaving for India to make a tour of inspection of the system. Road competition was occupying the attention of the Government of India. A Bill intended to put road and rail competition on a fair basis, had already been passed by the Lower Chamber. The railways demanded no monopoly; they merely wished for fair play in their efforts to bring prosperity to the states they served. While on the question of road transport, the Chairman mentioned the company's own road motor ventures. A service of freight lorries had been inaugurated on two routes and was proving very successful. The company had instituted several agencies, booking offices, and cartage systems outside the immediate area served by the system. New halts had been opened and an express freight service put into operation between Madras and Tuticorin on the company's metre-gauge sections. In 1936 the provision of 8 additional diesel railcars had been sanctioned. It had been found that these cars, being costly in operation, had not been as successful as had been hoped.

In the future the company would pursue a more energetic policy in regard to road services both in exercising more fully its own powers to run buses and in interesting itself in existing road motor enterprises. The company had benefited by the reorganisation of the Commercial Department and by the increased attention that had been paid to the value of publicity.

Unfortunately the company's fine record of safety had been marred by a serious accident, in which a train plunged into a breach caused by the phenomenal rainfall, thereby causing 32

passengers to be killed and 50 injured. The sympathy of the board was extended to all concerned. The Bibby Line appreciated the excellent facilities the company had provided in connection with its great improvement scheme at Cochin Harbour.

The Chairman stated that the capital outlay on the open line for the financial year ended March 31, 1938, amounted to Rs. 18,47,322, of which Rs. 9,07,526 were spent on engineering works, including the remodelling of Combatore and Pollachi stations, the

reballasting and relaying track and the provision of new offices at Trichinopoly. Passengers conveyed numbered 6.6 million more, and 130,852 tons more merchandise (representing an increase, in earnings, of Rs. 7,19,664) were carried than in the year 1936-1937. Working expenses had increased by Rs. 8,26,881. The company's share of surplus profits for the year 1936-37 was Rs. 1,45,183, which after a deduction of Rs. 27,752 to meet Indian taxes, gave Rs. 1,17,431 (£8,746) to be remitted to London. The total dividend distribution for the year would be 5 per cent. ( $1\frac{1}{2}$  per cent. from surplus profits and  $3\frac{1}{2}$  per cent. from guaranteed interest).

The report and accounts were unanimously adopted.

### Buenos Ayres Great Southern Railway Co. Ltd.

The annual general meeting of the Buenos Ayres Great Southern Railway Co. Ltd. was held at River Plate House, Finsbury Circus, London, E.C., on October 26, Sir Follett Holt, K.B.E., Chairman of the company, presiding.

The Secretary (Mr. N. F. E. Grey) read the notice convening the meeting and the auditors' report.

The Chairman, in moving the adoption of the report and accounts, said that since their last meeting their colleague Colonel Woodbine Parish had passed away. His distinguished father was the Chairman of the company from 1878 to 1906, and from that date he himself had been a Director. He was devoted to the service of the Great Southern and was at work at its office a few hours before his death, which ended to their sorrow a long and honourable connection. To fill the vacancy on the board they had elected Viscount Davidson, who had had a lifelong connection with Argentina and had already won for himself high distinction in public affairs.

Last year it had been described how in one year Argentina had turned round from depression to prosperity. At that time all promised well but in the following weeks a series of heavy frosts fell all over the country and, except in comparatively small areas, caused the almost total loss of the ripening crops. Nearly eight million tons less was exported and the favourable trade balance of 50 millions sterling was converted into an adverse balance. Hopes of a better exchange and other improved conditions were dashed to pieces for the time being, and now could revive only with the advent of a normal crop, which with any good fortune might come within the next few weeks.

Last year it was shown that measured by the amount of traffic transported, the railway still remained a progressive undertaking and one of vital necessity to the country. This was again evidenced, for the volume

of traffic measured in ton-mileage surpassed by 4.6 per cent. the previous figures and constituted another record in the company's history. But unfortunately although they more than made up the tonnage in other directions, they lost the carriage of one million tons of higher-rated grain, with the result that, doing more work for less pay, total traffic receipts fell by £112,000. On the expense side they had to face a heavy increase in the cost of practically all materials; moreover, as the pressure of traffic in the previous year had strained the company's stock of 16,000 wagons to the limit, and practically no new wagons had been purchased for a number of years, the management was obliged to embark upon a fairly extensive programme of rebuilding and heavy repairs in order to meet the ever-growing calls upon the existing stock. Furthermore, to meet public requirements and road competition, train services were increased and improved, causing additional expense which met only with a partial reward on account of the financial stagnation which fell so suddenly upon the Republic. In final result, with the loss in revenue and increase in expenses, after charging to the year the full cost of operating, they found themselves £514,000 worse off than in the previous year, and this explained how it became necessary to reduce the payments to the preference stock holders.

Although highways and byways were improved and extended all the time, there was no particular change to report in the situation as regarded road competition, except that they had good evidence that the policy of improving services and reducing fares and rates to meet this competition, was helping the railway to prevent further great inroads being made upon its traffic and even to regain traffic in many directions where it had been lost. The organisation to put in operation the National Transport Law intended to provide for the Government control of road vehicles and to prevent

overlapping with railway services, had been completed. Some progress had also been made in another desirable direction. What was commonly known as the Pooling Bill had passed the Senate and was now to be considered by the Chamber of Deputies. The Bill was intended to empower the Government without the further intervention of Congress to agree to the railways' pooling traffic, undertaking road transport, suppressing dead lines, transferring lines from one company to another, and to permit the amalgamation of one company with another, all when shown to be in the public and general interest.

If, as they devoutly hoped would be the case, they had a crop this season, the management would be in a better position to meet economically and well the ever-increasing public requirements. The improvements being made to coaching and wagon stock would help, as would also materially the 24 new steam and diesel locomotives, and the 77 new self-propelled passenger railcars, which would then be in service.

Shareholders would have heard no doubt of facts and rumours concerning the future policy of the Argentine Government towards the foreign-owned railways. The position of the Central Cordoba and Transandine systems having been determined, they had reason to believe that the new President and Government whilst wishing to find means to ameliorate the position of the other foreign-owned railways, in which Great Britain had such an enormous stake, also adhered to the policy of their nationalisation. For their company, and he maintained for the best interests of the Republic, the amelioration of the railway industry was an urgent need. It was obvious that those who had invested their money in the industry were not receiving the fair return to which by their courage and enterprise they were entitled and by their charters they were led to expect. Although the number of Argentine investors in the private railways was entirely insignificant, the number of Argentines who benefited from their service was enormous, and the railways had reached a stage at which without improved conditions their maintenance and development must be crippled. For this reason alone, if not in common equity, relief was overdue, for the maintenance of the efficiency of the railway system remained of vital importance to the Republic, and this led him to the question of nationalisation.

That a progressive and increasingly prosperous country such as Argentina should continue to depend largely upon foreign genius and wholly upon foreign resources for the care and development of its main lines of transport was a situation which could not last for ever. It was inevitable—in his opinion at any rate—that the people of Argentina through their Government should at least be prepared to share some of the responsibilities and the financial risks of the railways upon which their con-

tinued progress and prosperity so largely depended.

Two years ago when the renewal of the trade agreement between Argentina and the United Kingdom was under negotiation, Dr. Le Breton, who represented Argentina, gave him a message to the shareholders to the effect that his Government fully acknowledged the good services the railways had rendered and had every intention to help in the needed improvement to their position. Dr. Le Breton had now been appointed Ambassador in London and would

shortly arrive, he hoped, to assist to carry out the promise given at that critical time. Shareholders might rest assured that they would and must be consulted in the event of any proposals being made which would affect their interests.

Unless they were smitten again with frost in the near future, shareholders would be able to look forward next year to hearing a better account than it had been possible to give them that day.

The report and accounts were unanimously adopted.

### Assam Railways & Trading Co. Ltd.

The annual general meeting of the Assam Railways & Trading Co. Ltd. was held on Wednesday last, October 26, at Winchester House, Old Broad Street, E.C., Mr. E. A. A. Joseph (Chairman of the company) presiding.

The Secretary (Mr. S. Maclean Jack) read the notice convening the meeting and the auditors' report.

The Chairman in moving the adoption of the report and accounts said that he had repeated year after year the plain fact that their profits were largely governed by the price of Bengal coal and by the general state of trade regulating movement on their railway. These two factors, especially the first, had, as he forecast last year, moved in their favour. The result, combined with careful management in India, was reflected in the 50 per cent. all-round improvement which the accounts showed. All the company's interests had shared in greater or less degree in producing this improvement. In the railway the profit had improved from £44,594 to £66,464. Coal traffic was mainly responsible for this, but general traffic also showed a definite improvement. Whilst passenger traffic showed no increase in money (owing to reduced fares to meet competition) the number of passengers carried was growing. The development of the feeder bus services was continuing and it had been decided to increase the number of vehicles to six. Experiments were also to be made with two motor lorries. It had been decided that, to avoid raising the question as to whether a railway company in India had by its concession powers to run buses, to transfer these vehicles from the railway to the trading side of the company.

Expenditure again showed a decrease, the result of the most careful and continuous examination of each item of expenditure. The largest reduction was shown in the item "carriage and wagon expenses"—a reduced stock, and presumably better average condition, accounted for a reduced annual charge. The percentage of earnings represented by profit—44.56—had not been reached since 1933.

The collieries showed a very considerable and encouraging improvement. This followed from betterment in each of the three principal factors—increased sales, higher prices, and lower cost per

ton, as the result of the larger output.

The timber department had again done well, and showed a good advance. The principal member, the veneer mills, was working to its full capacity, as limited by the quantity of timber they were able to extract; and lastly, the brickworks, in their small way, had a good year.

The result of these activities was that the general trading account had improved this year by over £15,000—showing £49,744 against £34,275.

Both the tea companies in which they were interested published good accounts for 1937 and were able to increase dividends, the Makum Company paying 15 per cent. for the year, and the Namdang Company 10 per cent. The Rivers Company improved its dividend from 5 to 6 per cent. free of tax.

Regarding the company's prospects, the Chairman said that in the current year they had made a good start. The railway was holding its own, colliery sales had improved, and the monthly accounts so far received showed good results. Apart from some such general convulsion as they had just been through, and subject to Indian political activities or an act of God, he was hopeful about the result of the present year. He added that after the recent sharp rise, Bengal coal prices had however steadied—a point not for this year but 1939.

After payment of all the prior charges and making their usual provisions, they were left with a balance of £82,998 at credit of net revenue account. It was proposed that the usual amount of £3,000 be written off new issue expenses; as floods might have damaged coal stocks down river, it was suggested placing £2,000 to the credit of a coal stock reserve; and as next year they would be faced with a higher income tax assessment, it was recommended that an extra £5,000 should be set aside from this year's profits to meet that liability.

Payment of a 4 per cent. dividend on the A stock was recommended. This would leave a balance of £47,798, which was £3,441 more than brought in, and it was suggested that this be carried forward.

The report and accounts were unanimously adopted.



## Central Argentine Railway Limited

The annual general meeting of the Central Argentine Railway Limited was held at River Plate House, Finsbury Circus, London, E.C., on October 27, Mr. W. Howard-Williams, C.B.E., Chairman of the company, presiding.

The London Manager and Secretary (Mr. Ronald Leslie) read the notice convening the meeting and auditors' report.

The Chairman, in moving the adoption of the report and accounts, said that naturally it was hoped that the improvement discernible last year, coming as it did after seven lean years, would be maintained and extended. Nevertheless he had dwelt upon such uncontrollable factors as harvests and drought, already affecting some of the best wheat zones. From that time onward the picture grew steadily worse, until no less than one third of the wheat and half the linseed crop were wiped out. The situation as regards wheat was further aggravated by the growers withholding their output in the hope of higher prices, so that the tonnage transported was even less than that harvested. Further, a short period of intense heat and scorching winds in the critical month of December did damage to the new maize to such an irreparable extent that about half of it also was lost. The upshot was that in the last financial year the railway transported of maize, wheat, and linseed an aggregate tonnage of 3,460,000, as against 7,737,000 tons in the previous year, a decrease of 55 per cent., whilst the receipts from such tonnage was £1,962,000 as against £4,179,000, a decrease of £2,217,000, or 53 per cent. As a consequence both of this loss and of its inevitable effect on the general economy of the country, gross income for the year showed a total falling off of £2,902,000, and was the lowest since the war.

Strenuous efforts had been made to reduce expenses, though to do so proportionately to such a precipitate fall in receipts was an impossible task. Of total outgoings, 66 per cent. was absorbed by expenditure on staff whose position was safeguarded by labour regulations. Rising costs of materials meant that substantial economies had to be made merely to maintain the same position. Put another way, had the price of coal not risen the company would have been £120,000 better off. The outcome was that whilst a total reduction of working expenses of, in round figures, £1,000,000, had been effected, almost the whole of this had had to be obtained by the cutting down of contributions from revenue to the renewals fund. This brief picture of the last financial year was a sufficient explanation of why the directors, much to their regret, had found themselves unable to declare a dividend even on the preference stocks for the year.

Undoubtedly the outstanding feature of the past financial year had been the failure on a large scale of the three major harvests. That, serious though it was,

was something transitory. The soil of Argentina retained its richness of former years, and unless a quite unusual combination of circumstances again occurred Nature would redress the balance and their carryings would show the result. The latest cable from Buenos Aires gave grounds for hoping that process had already begun with respect to wheat and linseed. Poor maize crop, combined with slack foreign demand for this and other grain, was largely responsible for lower traffic receipts to date.

Passing to more permanent factors, the railway industry was passing, in all parts of the world, through a period of transition and of exceptional difficulty, and Argentina could be no exception. In all major countries schemes of one kind or another to deal with that situation were under discussion or tentative operation, and all such schemes had one basic idea in common, namely, that railways could not in any country be allowed to disappear or waste into inefficiency. That was particularly true of Argentina, where products calculated in millions of tons a year had to be moved rapidly, regularly, and efficiently. For such conditions the rail was still pre-eminent and the other forms of transport yet devised could not touch more than the fringe of it. But these other forms of transport could under existing conditions concentrate on its more lucrative components, and whilst so procuring a precarious existence for themselves render invested railway capital unremunerative. Under such conditions it could not be expected, and he believed the Argentine Government would recognise it, that new capital would be forthcoming.

The Central Argentine Railway continued to do what it could in the direction of modernisation. As examples, this year they had put into working 12 new railcars of an improved design to serve the outer suburbs of Buenos Aires. The railway had also provided the new feature of an air-conditioned long-distance train.

The Argentine Government knew the company's difficulties and viewed them, he believed, with increasing understanding. This opinion was confirmed by their colleague, Mr. Walter Whigham who, during the past financial year, went to Argentina to discuss with President Ortiz and the other national authorities the railway position in general. It might be that the National Government was helped in this increasing understanding by its own experience of railway operating, which was being increased and widened by the assumption during the past year of the working of the Cordoba Central by the Argentine State Railways. This concern, since it functioned in much the same zone as themselves, therefore shared much the same problems.

In the meantime, the Co-ordination of Transport Committee, formed under the sanction of the Law approved in January, 1936, had been constituting

itself with somewhat tantalising slowness. However, in the last few months it had begun its deliberations, and the experience gained should go far to help in shaping a transport policy of the future for Argentina. The opinion, he believed, was gaining ground that the powers of that committee called for enlargement.

The project of law sponsored by the Government itself to legalise pooling arrangements between the companies has been sanctioned by the Senate. It would now go for consideration by the Chamber of Deputies.

Losses for the year under exchange had naturally been less owing to their having, unfortunately, had less money to transmit. They hoped the present official rate of exchange would at least be maintained, for on the earnings of an average year, a difference of one peso either way on the present rate meant round about £200,000 to the company.

The Argentine Government which went out of office in February of the present year, approved as a part of its general policy the gradual taking over of the railways by the Government. This had been reaffirmed by the present Government through the responsible Minister during the debate in which sanction was given by the Chamber of Deputies last month to the purchase of the Cordoba Central Railway. He added that that particular purchase had been in contemplation since 1924. Whether the absorption of the other and much larger British-owned concerns would be a more rapid process, always providing the same policy was adhered to, he was unable to say. A financial transaction of the first magnitude would be involved, and in the event of anything tangible emerging, the shareholders' opinion would, of course, be obtained.

The resolution was then put before the meeting, and a shareholder, Mr. Barnabas Russell, put forward various criticisms concerning the presentation of the accounts and the constitution of the board. Describing the company's position as "disastrous," he ascribed it to the board's policy in undertaking, a decade ago, a policy of expansion, and of spending no less than £15 million of capital, again during the last ten years. All that money had been raised by the issue of debentures, in some cases at a disastrous loss, and the capital structure of the company, which ten years ago was the best of the Argentine companies, had been "ruined." All the expenditure had produced only 400 miles of line, and he wanted to know whether these 400 miles of line had produced any result.

The Chairman, replying, took as an example of the company's new work the Forres branch, construction of which unfortunately coincided with the world crisis. It cost about £3 million to build, and in its first year of working brought a gross return of £100,000. Every year since there had been an increase of £100,000 in receipts, and last year £550,000 was earned.

The report and accounts were adopted.

## NOTES AND NEWS

**Carter Paterson in the North West.**—On September 28 the name of Karriers Parcels Delivery Limited—one of the Carter Paterson group—was changed to Carter Paterson (North Western) Limited. The company's headquarters are at Liverpool.

**Air-conditioning in South Africa.**—Arrangements are being made to include air-conditioned saloons in the Union Express and Union Limited trains, on the Cape Town—Pretoria section, at an early date. In addition to the 3s. charged for bedding for an unbroken journey (including, in some cases, two nights), a further facility is bedding with a spring mattress at 6s.

**L.M.S.R. Properties in Manchester.**—On November 9 and 10 Messrs. Daniel Watney & Sons are auctioning in 82 lots numerous freehold and leasehold properties of the L.M.S.R. in Manchester and district. Comprised in the list are 424 cottages, 30 shops, various commercial premises, and building land. The gross rents amount to about £11,600 a year.

**New Railway Bridge Across Yenisei, U.S.S.R.**—The new railway bridge across the Yenisei river in Siberia was officially opened on October 20, when a train weighing 1,200 tons was driven across it by the engine drivers Cherniavsky and Sergeyev. Since then the bridge has been used for regular traffic. The new bridge is one of the largest in the Soviet Union, having eight spans and a total length of 3,042 ft.

**Tourist Traffic in Norway.**—The number of foreign passengers entering Norway by rail this year shows an increase of some 28 per cent., regular steamship services show an increase of over 30 per cent., and road traffic an increase of about 20 per cent. It is estimated that summer traffic this year will show an increase of between 20 and 25 per cent., according to a Reuters Trade Service message from Oslo. The income derived from foreign tourists which amounted in 1937 to Kr. 67,000,000, will probably total some Kr. 80,000,000 this year.

**Worcester Station Improvements, G.W.R.**—A scheme of improvements is to be carried out by the Great Western Railway at Worcester Foregate Street station. The present approach to the station from Foregate Street is a granite paved open space. This is to be converted into a bright, colourful arcade type of entrance 30 ft. wide and extending 46 ft. from the road to the ticket barrier, giving access to the concourse and steps leading to the platforms. The present booking office will be demolished so as to make for unrestricted movement, and a new one with modern grills will be built on one side of the arcade. The existing luggage lift is to be moved to a position next to the booking office to afford easier passage of traffic to and

from the concourse from which the platforms are reached. Next to the lift will be the cloakroom, which will form a part of the parcels office.

**Proposed U.S.A. Railroad Merger.**—The Chicago & North Western and the Chicago, Milwaukee, St. Paul & Pacific Railroads announced on Wednesday that they have agreed on a preliminary plan to consolidate. The scheme would enable an annual saving in operating expenses of over \$10,000,000 and involve the sale of \$80,000,000 first mortgage bonds.

**Reductions of L.N.E.R. Train Services.**—The L.N.E.R. announces that from Monday next, October 31, considerable alterations are to be made to the passenger train services in the Southern, North Eastern, and Southern Scottish Areas. Included is the cancellation in the North Eastern Area of about 140 weekday, Saturdays only, and Sunday trains. In the Southern Area, 20 trains in the Great Eastern section are to be discontinued. These are practically all on local services.

**Canadian Conservative Railway Policy.**—In a recent speech at London, Ontario, Dr. Manion, Canadian Conservative leader, expressed his views on railway matters. After stating that amalgamation of the C.P.R. and C.N.R. systems was no solution of a problem resulting from the overbuilding of 10,000 miles of line, he emphasised that increase of traffic was the obvious remedy for the existing trouble. This would be secured if the people at present in receipt of relief had decent purchasing power, and if the population of the Dominion was increased by 2,000,000 through the medium of immigration, according to a summary of the speech in *The Times*.

**Argentine Railway Earnings.**—The gross receipts of the privately-owned Argentine railways for the financial year ended June 30, 1938, amounted to 400,691,000 pesos m/n, a decrease of 56,174,000 pesos, or 12.3 per cent., compared with the total of the previous financial year. The decrease was due to the drop in goods traffic, as passengers showed an increase. Passengers carried totalled 150,694,000, or 11,239,000 (8.1 per cent.) more, but goods traffic showed a serious drop, total tonnage amounting to only 33,566,000, or 8,167,000 tons (19.6 per cent.) less. Passenger receipts, at 90,128,000 pesos, were 3,061,000 pesos, or 3.5 per cent. more, but goods receipts, 261,755,000 pesos, were down by 58,574,000 pesos, or 18.3 per cent. The corresponding passenger-km. and goods ton-km. were 5.4 per cent. more and 12.4 per cent. less, respectively. The gross receipts of the British-owned railways, included in the totals given above, were 364,882,000 pesos, or 45,163,000 (11 per cent.) less than in 1936-37. For this group also, while passenger receipts were 3.8 per cent. more, goods traffic

had fallen by 16.9 per cent. The Cordoba Central figures are not included in these results, as this railway is now considered as a State-owned line.

**Oslo Central Station Committee.**—The Norwegian Government recently appointed a committee to investigate and report on the long-standing question of a central station for Oslo, a matter which has several times been referred to in these columns. The Chairman is Herr Granholm, the former General Manager of the Swedish State Railways, and the members are Herren Aubert, Darre-Jensen, F. Bjerke, Ole Berg, Oscar Fischer, Trygve Nilsen, and F. Dahl, chosen to represent the principal national and local interests concerned.

**Canadian Transcontinental Line Memorial.**—To provide a lasting commemoration of the completion of the Canadian Pacific Railway from coast to coast, a cairn erected in the city hall grounds of Port Moody, B.C., on the shores of Burrard Inlet, by the Historic Cities & Monuments Board of Canada, was recently unveiled by Mr. John Murray. He is Port Moody's oldest citizen, and was present on the platform there in November, 1885, when the first Canadian Pacific transcontinental train arrived.

**Czech-Roumanian Frontier.**—In consequence of the Hungarian claim in its frontier negotiations with Czechoslovakia that the revised frontier line shall transfer the whole of Ruthenia to Hungary, Roumania has made representations in Prague. The Roumanian request is that should the Hungarian claim to Ruthenia be granted, Roumania would wish for the transfer to itself of a strip of territory in Ruthenia necessary to maintain easy railway communication between Roumania and Poland. This strip of territory extends approximately from Halmei to Teresva, and includes the railway line between these points through Kráľovo. This line was indicated on the map published on page 562 of our September 30 issue, and the accompanying text matter explained how the double severance of a through railway line by post-war frontiers had resulted in the establishment of a Czech-Roumanian joint railway administration.

**Alleged Jewel Thefts from Trains.**—It was stated at Marylebone Police Court on Tuesday, that jewelry and other property worth £11,000 had disappeared during the last six months from first class compartments of trains on the four main lines. John Cunningham, 24, was remanded by Mr. Ivan Snell on three charges of stealing and receiving from first class compartments of trains on the Great Western Railway between Paddington and Leamington and Swindon and Paddington jewelry to the total value of £1,650 and a suitcase and contents worth £8. Mr. P. W. Pine (Common Law and Chancery Assistant, Solicitor's Office, Great Western Railway), for the prosecution, said that the thefts

had taken place while the passengers were having a meal in the dining compartments of the trains. On October 17 the accused was seen on the 11.15 a.m. Bath and Bristol express. He eventually arrived at Swindon and got into a first class compartment of a Bristol and London train. There were two suitcases left in a first class compartment, the owner having gone to luncheon. Shortly afterwards a watching detective missed one of the cases and found the lavatory door at the end of the corridor was locked. He concealed himself. Later the suitcase was replaced. The detective kept a lookout, and, walking along the corridor, met the accused carrying the other suitcase. The accused said: "Excuse me, sir, is this yours?" The detective replied: "No, it is not mine and it is not yours. I want you; I am a police officer." When the accused was searched, articles of jewelry were found on him. His house was searched and there were found articles of jewelry and pawntickets showing advances on property to the amount of £400. Part of the property had been identified.

**S.R. Supervisors' Association.**—The Southern Railway Supervisors' Association (embracing all departments of the railway) held its twentieth annual dinner and concert at the Lyons Corner House, Coventry Street, Piccadilly, on Tuesday, October 18, and a most enjoyable evening was spent by the 250 members of the association and friends who were present. The chair was occupied by Mr. E. J. Missenden, the Traffic Manager, and others present were:—

Messrs. E. C. Cox (late Traffic Manager), G. Ellison (Chief Engineer), H. E. O. Wheeler (Superintendent of Operation), R. M. T. Richards (Assistant Traffic Manager), A. Cobb (Locomotive Running Superintendent), C. Grasmann (Public Relations and Advertising Officer), R. G. Davidson (Joint Accountant).

In the course of his remarks, Mr. Missenden warmly expressed thanks to the members of the supervisory staff for their successful efforts in many directions, and took the opportunity of reviewing the past year's working of the Southern Railway. Reference was made to the progress of electrification; also to further schemes still to be completed.

## British and Irish Railway Stocks and Shares

Stocks	Highest 1937	Lowest 1937	Prices	
			Oct. 26, 1938	Rise/ Fall
G.W.R.				
Cons. Ord. ....	67½	55¾	31½	+1
5% Con. Prefce. ....	127	108	93½	+2½
5% Red. Pref. (1950) ..	113	109	96	+1½
4% Deb. ....	113½	102½	103½	+1
4½% Deb. ....	118	106	104½	—
4½% Deb. ....	124½	112	110½	+1
5% Deb. ....	136½	122½	122½	+1
2½% Deb. ....	76	64	66½	—
5% Rt. Charge ....	133½	118	119½	+1
5% Cons. Guar. ....	133¾	116½	113½	+2
L.M.S.R.				
Ord. ....	36½	25½	13½	+1
4% Prefce. (1923) ....	82½	65¾	29½	+2½
4% Prefce. ....	92½	77¾	53½	+2
5% Red. Pref. (1955) ..	107¾	102	76½	—
4% Deb. ....	108	99¼	99½	+1
5% Red. Deb. (1952) ..	117½	111	108*	+1½
4% Guar. ....	104	95½	90½	+½
L.N.E.R.				
5% Pref. Ord. ....	12½	6¾	4½	+½
Def. Ord. ....	6¼	3½	2¾	+½
4% First Prefce. ....	79½	63	28½	+3
4% Second Prefce. ....	31½	21	11	+1
5% Red. Pref. (1955) ..	101½	89¾	45½	—
4% First Guar. ....	103	91½	80½	+½
4% Second Guar. ....	97½	85½	59½	+½
3% Deb. ....	84½	74	70½	+½
4% Deb. ....	107¼	98½	92	+½
5% Red. Deb. (1947) ..	113½	106½	105½	—
4½% Sinking Fund Red. Deb. ....	110½	105½	105½	—
SOUTHERN				
Pref. Ord. ....	98½	83½	55½	+3
Def. Ord. ....	27½	16¾	12½	+1
5% Pref. ....	126½	105½	96½	+2
5% Red. Pref. (1964) ..	118	110¼	100½	—
5% Guar. Prefce. ....	133¾	116¾	112½	—
5% Red. Guar. Pref. (1957) .....	118½	111½	110½	—
4% Deb. ....	112	101½	103½	+½
5% Deb. ....	135¾	123½	123½	+1
4% Red. Deb. ....	113	105	105½	+1
1962-67				
BELFAST & C.D.				
Ord. ....	5	4	4	—
FORTH BRIDGE				
4% Deb. ....	106	99½	100½	—
4% Guar. ....	105¾	99	99½	—
G. NORTHERN (IRELAND)				
Ord. ....	11	5	2½	—
G. SOUTHERN (IRELAND)				
Ord. ....	50	21½	11	+2
Prefce. ....	61	34	16½	+3¼
Guar. ....	94¾	69½	39½	+3½
Deb. ....	95	82½	63	+4
L.P.T.B.				
4½% "A" ....	123¾	110½	115½	—
5% "A" ....	135	121½	123½	—
4½% "T.F.A." ....	108¾	104	104	—
5% "B" ....	125	114½	116½	—
"C" ....	99¾	75	77	+½
MERSEY				
Ord. ....	42½	22	20	+1
4% Perp. Deb. ....	103	96¾	97½	—
3% Perp. Deb. ....	77½	74½	67½	—
3% Perp. Prefce. ....	68¾	61¼	59	—

## British and Irish Traffic Returns

GREAT BRITAIN	Totals for 42nd Week			Totals to Date		
	1938	1937	Inc. or Dec.	1938	1937	Inc. or Dec.
<b>L.M.S.R. (6,834 mls.)</b>						
Passenger-train traffic...	465,000	469,000	— 4,000	22,391,000	22,383,000	+ 8,000
Merchandise, &c. ...	473,000	546,000	— 73,000	18,893,000	20,781,000	— 1,888,000
Coal and coke ...	267,000	266,000	+ 1,000	10,427,000	10,653,000	— 226,000
Goods-train traffic ...	740,000	812,000	— 72,000	29,320,000	31,434,000	— 2,114,000
Total receipts ...	1,205,000	1,281,000	— 76,000	51,711,000	53,817,000	— 2,106,000
<b>L.N.E.R. (6,315 mls.)</b>						
Passenger-train traffic...	287,000	295,000	— 8,000	14,477,000	14,567,000	— 90,000
Merchandise, &c. ...	335,000	389,000	— 54,000	13,221,000	14,252,000	— 1,031,000
Coal and coke ...	266,000	268,000	— 2,000	9,858,000	10,358,000	— 500,000
Goods-train traffic ...	601,000	657,000	— 56,000	23,079,000	24,610,000	— 1,531,000
Total receipts ...	888,000	952,000	— 64,000	37,556,000	39,177,000	— 1,621,000
<b>G.W.R. (3,737 mls.)</b>						
Passenger-train traffic...	198,000	201,000	— 3,000	9,420,000	9,489,000	— 69,000
Merchandise, &c. ...	198,000	223,000	— 25,000	7,790,000	8,415,000	— 625,000
Coal and coke ...	117,000	119,000	— 2,000	4,493,000	4,673,000	— 180,000
Goods-train traffic ...	315,000	342,000	— 27,000	12,283,000	13,088,000	— 805,000
Total receipts ...	513,000	543,000	— 30,000	21,703,000	22,577,000	— 874,000
<b>S.R. (2,140 mls.)</b>						
Passenger-train traffic...	281,000	280,000	+ 1,000	14,015,000	14,060,000	— 45,000
Merchandise, &c. ...	65,500	71,000	— 5,500	2,555,500	2,671,000	— 115,500
Coal and coke ...	34,500	29,000	+ 5,500	1,267,500	1,273,000	— 5,500
Goods-train traffic ...	100,000	100,000	—	3,823,000	3,944,000	— 121,000
Total receipts ...	381,000	380,000	+ 1,000	17,838,000	18,004,000	— 166,000
<b>Liverpool Overhead (6½ mls.)</b>						
... ..	1,237	1,283	— 46	57,365	54,834	+ 2,531
<b>Mersey (4½ mls.)</b>						
... ..	4,438	4,282	+ 156	184,265	176,605	+ 7,660
<b>* London Passenger Transport Board</b>						
... ..	581,600	569,900	+ 11,700	9,597,200	9,545,500	+ 51,700
<b>IRELAND</b>						
Belfast & C.D. pass. (80 mls.) ...	1,780	1,797	— 17	108,649	112,356	— 3,707
" " goods ...	423	534	— 111	18,309	20,513	— 2,204
" " total ...	2,203	2,331	— 128	126,958	132,869	— 5,911
Great Northern (543 mls.) pass. ...	9,450	10,700	— 1,250	476,900	481,700	— 4,800
" " goods ...	11,400	9,500	+ 1,900	379,700	399,100	— 19,400
" " total ...	20,850	20,200	+ 650	856,600	880,800	— 24,200
Great Southern (2,076 mls.) pass. ...	30,634	34,776	— 4,142	1,581,136	1,582,441	— 1,305
" " goods ...	50,163	49,176	+ 987	1,680,078	1,724,507	— 44,429
" " total ...	80,797	83,952	— 3,155	3,261,214	3,306,948	— 45,734

\* 17th week (before pooling)

\* ex dividend



## CONTRACTS AND TENDERS

Ransomes & Rapier Limited has received an order from the London Passenger Transport Board for an electric traverser required for the new carriage depot at Ruislip.

T. Beynon & Co. Ltd. is stated to have received an order from the Egyptian State Railways Administration for 600,000 metric tons of Welsh coal.

The Siamese State Railway Administration has placed the following orders for permanent way equipment to be supplied to the inspection of Messrs. Sandberg:—

Miniere Metallurgique de Rodange: 3,444 metric tons of steel rails.  
Arbed, Belval: 2,540 metric tons of steel rails.

Société Commerciale d'Ougrée: 170 metric tons of fishplates and 69 metric tons of base-plates.

Bochumer Verein: 10 sets of crossings.  
S.A. La Brugeoise Nicaise et Delcuve: 78 sets of crossings and switches.

John Lysaght Limited has received an order from the South Indian Railway Administration for 261 steel panel sheets to be supplied to the inspection of Messrs. Robert White & Partners.

Bochumer Verein A.G. has received an order from the Morvi Railway for 39 locomotive tyres to be supplied to the inspection of Messrs. Robert White & Partners.

D. Wickham & Co. Ltd. has received a repeat order from the Peruvian Corporation for two Saurer diesel-engined motor bogies required for conversion of a railcar for the Central Railway.

The Crown Agents for the Colonies have recently placed the following orders:—

Universal Steel Tube Co. Ltd.: Locomotive steel tubes.

Ford Motor Co. Ltd.: Lorry chassis.

Morris Industries Exports Limited: Motor transport vehicles.

H. Morris Limited: Overhead travelling crane.

Stewarts and Lloyds Limited: Pig iron, water pipes and fittings.

Guest, Keen & Nettlefolds Limited: Rail clips.

J. & E. Hall Limited: Refrigerating plant.

Rivet Bolt & Nut Co. Ltd.: Rivets.

P. & W. Maclellan Limited: M.S. rods.

Brush Electrical Engineering Co. Ltd.: Static transformers.

Metropolitan Vickers Electrical Export Co. Ltd.: Static transformers.

A. & J. Inglis Limited: Steelwork.

Edgar Allen & Co. Ltd.: Switches and crossings.

Ferguson, Pailin Limited: Switchgear.

Ericsson Telephones Limited: Telephone switchboards.

Associated British Machine Tool Makers Limited: Tube expanding and reducing press.

London Passenger Transport Board: Wheel lathe.

Eyre Smelting Co. Ltd.: White metal.

The Tata Iron & Steel Co. Ltd. has received an order from the Indian Stores Department for 180 tons of mild steel flat at a total price of Rs. 32,400.

Turkey is to spend £2,655,000 in Germany for the purchase of 90 locomotives, 25 refrigerator wagons, and 12 diesel railcars, states a Reuters message from Istanbul.

### Austrian Rolling Stock Industry

Since the annexation of Austria by Germany, there has been a boom in the Austrian rolling stock industry, according to the *Deutsche Bergwerks-Zeitung*. Just before the annexation, business was very restricted, causing an almost complete standstill in that industry. Of the three carriage and wagon-builders in existence previously, only the Maschinen und Waggonbau-Fabriks A.G. Vorm. H. D. Schmid, of Vienna, was still in operation, and even at its works the staff was continually being reduced; the Austrian Federal Railways, the chief buyers, were ordering no wagons. With the annexation, says the paper, the situation in the industry changed at once. Big orders by the German railways led to a great revival of activity in it, which was emphasised by the reopening of the Graz wagon works by the Schmid company. Altogether 1,500 goods and coaching vehicles were ordered at that time by the German railways. Since then both those railways and Austrian industry have placed big orders, among which are 500 four-wheeled goods wagons, six bridge trucks, 50 bogie coaches, 10 diesel-hydraulic railcars, five diesel-electric locomotives for narrow-gauge lines, and 20 diesel-electric railcars. With all these orders to be worked off, both the Vienna and the Graz works will be busy until well into next year.

### Coaches Required for Egypt

Tenders are invited by the Egyptian State Railways Administration, receivable at the General Management, Cairo station, by December 24, for the supply of 20 or 40 third class bogie coaches. A copy of the conditions may be obtained from the Chief Inspecting Engineer's Office, London, S.W.1.

The South African Railways & Harbours Administration is calling for tenders (Tender No. 1953) for the supply and delivery of approximately 16 tons of steelwork, together with rivets, bolts, and nuts required for a footbridge. Tenders endorsed "Tender No. 1953 for Bridgework" should reach the Chief Stores Superintendent, South African Railways & Harbours Headquarters Offices, Room 38A, Purchase Section, Johannesburg, by November 17, 1938.

Tenders are invited by the Chief Controller of Stores, Indian Stores Department (Engineering Section), Simla, receivable by November 28, for the supply of one spiral axlebox planer and one capstan lathe.

Tenders are invited by the Chief Controller of Stores, Indian Stores Department (Engineering Section), Simla, receivable by November 16 for the supply of axles and tyres required for the E.B. Railway at Saidpur and Kanchrapara as follow: 22 engine bogie axles, three driving axles, two leading coupled axles, four tender

axles, two trailing truck YF class axles, 392 engine tyres of sizes, 11 leading, driving, and trailing tyres, and 12 locomotive crane tyres.

Tenders are invited by the Director-General, India Stores Department, Belvedere Road, Lambeth, London, S.E.1, receivable by November 8, for the supply of carriage and wagon buffer heads and drawgear.

## Forthcoming Events

- Oct. 28 (Fri.).—Permanent Way Institution (Hull), at Lecture Hall, Paragon Station, 7 p.m. "Modern Signalling in Relation to Permanent Way," by Mr. O. S. Nock.
- Oct. 30 (Sun.).—Omnibus Society. Visit to Birmingham Corporation Tramways.
- Nov. 1 (Tues.).—Institute of Transport (Bristol), at Bristol Tramways and Carriage Co.'s Welfare Centre, Easton Road, 7 p.m. "Some Aspects of Local Passenger Transport," by Mr. B. Miller.
- Institute of Transport (Leeds), at Hotel Metropole, King Street, 6.30 p.m. "A Railway Company's Road Transport Services in North East England," by Mr. A. Harrison.
- Institution of Civil Engineers, Great George Street, London, S.W.1, 6 p.m. Presidential Address, by Mr. W. Binnie.
- L.N.E.R. (York) Lecture and Debating Society at Railway Inst., Queen Street, 6.45 p.m. "Film Publicity," by Mr. M. Cameron.
- Nov. 3 (Thurs.).—Institute of Transport (Nottingham Graduate), at Guildhall, 7 p.m. "Shipping and Forwarding," by Mr. L. Holmes.
- Railway Club, at Royal Scottish Corporation Hall, Fetter Lane, London, E.C.4, 7.30 p.m. "The History of the Steam Tram," by Dr. H. Whitcombe.
- Nov. 4 (Fri.).—Institute of Transport (Newcastle Graduate), at Royal Station Hotel, 7.30 p.m. Display of Transport Films.
- Omnibus Society, at Inst. of Marine Engineers, The Minories, London, E.C.3, 7 p.m. "Bus Services from London to the Country. Notes on their Development and Future," by Messrs. L. Nicholson and C. Klapper.
- Stephenson Locomotive Society (Scottish), at Ewarts', Bernard Terrace, Edinburgh, 7 p.m. Discussion.
- Nov. 7 (Mon.).—Engineers' German Circle, at Inst. of Mechanical Engineers, Storey's Gate, London, S.W.1, 6 p.m. "Der Dampfkesselbau in Deutschland (Boiler Construction in Germany)," by Dipl.-Ing. F. Weber.
- G.W.R. (Birmingham) Lecture and Debating Society, at Great Western Hotel, Snow Hill Station, 6.30 p.m. "Palestine Today," by Mr. A. Butler.
- Permanent Way Institution (London), at Underground Railways' Dining Club, Pelham Street, S.W.7, 7 p.m. "Modern Signalling in Relation to Permanent Way," by Mr. O. S. Nock.
- Nov. 8 (Tues.).—Institute of Transport (Birmingham), at Queen's Hotel, 6 p.m. "A Plea for a Scientific Enquiry into Transport," by Mr. G. Lissenden.
- Institute of Transport (Metropolitan Graduate), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 6 p.m. "Conservancy Duties in the Tideway of a Modern Port," by Mr. W. Flere.
- Permanent Way Institution (Sheffield), at Royal Victoria Hotel, 7 p.m. "Mechanical Signalling," by Mr. A. Moss.
- Permanent Way Institution (York), at Railway Inst., Queen Street, 6.30 p.m. "Oxy-Acetylene Welding as Applied to Track Work," by Mr. R. Doré.
- Nov. 9 (Wed.).—Diesel Engine Users' Association, at Caxton Hall, Caxton Street, London, S.W.1, 5 p.m. "Diesel Engines and the World's Fuel," by Mr. J. Broeze.
- Nov. 10 (Thurs.).—G.W.R. (London) Lecture and Debating Society, in General Meeting Room, Paddington Station, 5.45 p.m. Debate with Birmingham Society.

## Annual Dinner of the Institution of Mechanical Engineers

The Right Hon. Sir Kingsley Wood, Secretary of State for Air, was the guest of honour at the annual dinner of the Institution of Mechanical Engineers, held at the Connaught Rooms, London, on Thursday, October 20. Mr. David E. Roberts, the President of the institution for this year, occupied the chair.

Mr. E. Bruce Ball proposed the toast of "The Guests" and made special reference to the presence of distinguished members of the Defence Forces, saying that it was a matter for rejoicing that the recent international tension had relaxed and made it possible for them to be present. He also remarked that the President had the support of all the surviving Past-Presidents of the institution, which must be a record for any institution. The presence of Mr. Dow, a Past-President of the American Society of Mechanical Engineers, was particularly welcome as they hoped to see more of him when the institution visited New York next September for a joint meeting with the American society. In coupling the toast with the name of Sir Kingsley Wood, he alluded to his untiring energy and resourcefulness, which had brought the Post Office to its present state of efficiency. They felt confident that under his guidance the Air Force would become equal to all the demands which might be made upon it.

Sir Kingsley Wood, in his response, referred to the valuable assistance given from time to time by the institution to the Air Ministry. The Air Ministry recognised that it was the menace of the air which was the main cause of dread and unrest in the world today, and it was to combat this that they must devote their efforts. The sudden expansion of aircraft production and the change-over to the new technique of all-metal construction had made great demands on managerial and technical staffs. He gave an assurance that the Air Ministry was not only intensifying the policy of utilising the resources of the smaller aircraft firms and extending the use of subcontracting, but was also broadening considerably the basis of aircraft construction by availing itself of important organisations outside the aircraft industry proper.

The Right Hon. Lord Rayleigh, President of the British Association, proposed the toast of "The Institution." As a lover of the countryside he dwelt on the changes which the hand of the engineer had wrought, and referred to the remark of Lord Grey of Fallodon that the last of the useful inventions was the push-bike. Nevertheless, on striking a balance of the evils and the good for which the engineer was responsible, he was inclined to think that the ordinary dweller in the country or in the town owed a great deal to the engineer, and it was therefore with

pleasure that he proposed the toast of the institution.

The President, in reply, spoke of the work of the institution, and stated that it had recently started to prepare a register of the technical qualifications of the members, and that a response had already been received from about 6,000 members. He then referred to one or two guests whom Mr. Bruce Ball had

not been able to mention, and in particular the Mayor of Merthyr Tydfil. Merthyr Tydfil was his old home and was in former times the most famous iron-making centre in the world. He also referred to Mr. Donkin, the President of the Institution of Civil Engineers, and said that the two institutions had greatly extended the basis of co-operation in their work. The multiplicity of technical societies today rendered it necessary that the few senior ones should get together and establish a position of security for the engineering profession as a whole.

## American Permanent Way Convention

On September 20-21-22 at Chicago the Roadmasters and Maintenance of Way Association of the U.S.A. held its 53rd annual convention. The convention included in its programme six reports by committees, five addresses by officers on present day problems, and an exhibition of permanent way maintenance materials and equipment, presented by the Track Supply Association. One of the principal features of the gathering was a luncheon attended by over 200 members and guests, at which Mr. W. K. Wallace, Chief Engineer of the London Midland & Scottish Railway, delivered an address on "American and European Maintenance Practices." There were also a banquet given by the Track Supply Association, an exhibition of a colour film describing the manufacture of steel by the United States Steel Corporation, a general impromptu discussion of practical subjects, and a visit to the permanent way manufacturing plant of the Pettibone Mulliken Corporation.

The wide range of subjects covered in the reports and addresses at the convention included: the equipment of

gangs, maintenance to meet present-day operating requirements, elimination of derailments resulting from track defects, maintenance of turnouts, programming of trackwork, instruction of labour in safety, the roadmaster's job, better track construction for tomorrow's traffic, and the efficient employment of labour. In addition subjects for the ensuing year were: specialised *versus* section gangs, maintenance of curves, heaving track, its causes and remedies, anchoring track to meet the traffic of today, roadmasters' qualifications and duties, and the use of roadway machines. A few of the facts emerging from the proceedings were that most railroads now provide their sections with motor trollies. Also that special light-weight high-speed diesel trains do not adversely affect the track even at 90-100 m.p.h., but widespread improvement of roads, and especially of curves, is essential for rapidly increasing speeds both on main and subsidiary lines, particularly with steam traction. The combination of mechanical and track defects was referred to as a frequent cause of derailment.

## RAILWAY AND OTHER REPORTS

**Bombay, Baroda & Central India Railway Co. Ltd.**—The directors, at their meeting on October 26, authorised the payment in January next, in addition to the half-year's guaranteed interest of £1 10s. per cent., of an interim dividend of £1 10s. per cent. in respect of the company's profits for the financial year 1938-39.

**Manila Railway Co. (1906) Ltd.**—Income for the year to June 30 last amounted to £140,069, made up of £133,202 from interest held by this company in the Manila Railroad Company, £6,846 from interest on the company's holding of its own debentures, investments, and bank interest, and £21 from transfer fees. The balance carried to net revenue account is £120,495, after providing for fees, &c., and £14,950 for taxation. Interest on the A and B debentures and stock takes £87,095, and the B debenture Sinking Fund £24,686. This leaves a balance of £8,714, out of which a dividend of 1 per cent., less tax, is being paid,

which requires £8,698. The £16 remaining, plus £2,336 brought in, is carried forward.

**Bahia Blanca & North Western Railway Co. Ltd.**—The board reports that the guaranteed rental of £440,000 due from the Buenos Ayres Great Southern Railway Company in respect of the year ended June 30, 1938, has been received and the dividend on the £4,600,000 of 4½ per cent. guaranteed stock has been duly paid. The London office expenses, including directors' fees, have been paid by the working company.

**INCREASING MEXICAN RAILWAY DEFICIT.**—The National Railways of Mexico—recently expropriated by the Government and handed over to a managing committee appointed by and from among the employees—recorded an excess of expenditure over earnings of 900,000 pesos in August and 1,200,000 pesos in September. The management does not expect to meet its obligations until 1939, according to *The Times*.

## Railway Share Market

Following the commencement of the new Stock Exchange account on Monday, most sections of the stock and share markets became more active. Sentiment was assisted by rather more encouraging reports from industrial centres, particularly in regard to iron and steel concerns which are benefiting from the accelerated rearmament programme.

Despite the disappointing traffics for the past week, Home railway stocks are higher on balance. The favourable views now current in regard to the outlook for the heavy industries brought in buyers for L.N.E.R. and L.M.S.R. preference stocks. Hopes of a dividend of 3½ per cent. on L.M.S.R. 4 per cent. preference resulted in a better price of 53½ in this case, while the 1923 preference transferred up to 30 and the ordinary stock was better at 13½. L.N.E.R. first preference was firmer at 29, as was the second preference at 11, while the first and second guaranteed stocks were 79½ and 58½ respectively. Moreover, the debentures of the last-named railway found buyers on a

more general belief that, all points considered, they can be regarded as undervalued in relation to the debenture stocks of the other main line railways. The 4 per cent. debentures were firmer at 92½, as were the 3 per cent. debentures at 70.

Great Western ordinary participated in the better trend, although, as in many other instances, best prices touched earlier in the week were not quite fully held. Southern preferred were a good feature at the higher level of 56½ on growing hopes that a dividend of at least 3½ per cent. is in prospect for the current year. The deferred stock also made the better price of 12½. Sentiment in regard to Southern stocks was assisted by the possibility that the main line railways may shortly apply to the Railway Rates Tribunal for an increase in fares in the "pooled" London area. This also benefited London Transport "C" which improved to 77½ in advance of publication of the annual report. The "B" stock was better, while various London Transport prior charges were also reported to be in demand.

Interest in foreign railway securities was again largely confined to those of the Argentine companies, which continued under the influence of the encouraging crop outlook. The favourable impression created by the statements at the B.A. Gt. Southern meeting was also a helpful factor, but best prices were not held, and conditions were less active than last week. B.A. Gt. Southern 5 per cent. and 6 per cent. preference stocks were fairly steady around 45½ and 31½ respectively and the ordinary improved to 12½. Central Argentine ordinary was firmer at 10, while the 6 per cent. preference strengthened to 31½ and the 4½ per cent. preference to 27. B.A. Western 4½ per cent. preference was better at 23. B.A. and Pacific consolidated debentures improved to 35, and, where changed, debenture stocks generally moved moderately in favour of holders. San Paulo and Antofagasta ordinary were steadier but had an inactive appearance. American railway stocks were subject to a fair amount of profit-taking. French railway sterling bonds improved.

### Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

Railways	Miles open 1937-38	Week Ending	Traffics for Week		No. of Weeks	Aggregate Traffics to Date			Shares Stock	Prices							
			Total this year	Inc. or Dec. compared with 1937		Totals		Increase or Decrease		Highest 1937	Lowest 1937	Oct. 26, 1938	Yield (Per Cent.)				
						This Year	Last Year										
South & Central America	Antofagasta (Chili) & Bolivia	834	23.10.38	£ 15,000	-	£ 3,320	43	£ 631,180	705,640	-	£ 74,460	Ord. Stk.	29	101½	10	Nil	
	Argentine North Eastern	753	22.10.38	10,732	+	571	17	182,618	176,509	+	6,109	Ord. Stk.	1914	6	5½	5	Nil
	Argentine Transandine	..	..	..	..	..	..	..	..	..	..	A. Deb.	93½	60	80	5	Nil
	Bolivar	174	Sept., 1938	3,500	-	250	39	33,650	49,350	-	15,750	6 p.c. Deb.	91½	5	8½	10	Nil
	Brazil	..	..	..	..	..	..	..	..	..	..	Bonds	17	9	6	8½	Nil
	Buenos Ayres & Pacific	2,806	22.10.38	72,705	-	9,925	17	1,177,360	1,333,624	-	156,264	Ord. Stk.	171½	5½	5	Nil	
	Buenos Ayres Central	190	8.10.38	\$143,900	-	\$1,900	15	\$1,808,800	\$2,155,300	-	\$346,500	Mt. Deb.	41½	18	15	Nil	
	Buenos Ayres Gt. Southern	5,084	22.10.38	135,360	-	310	17	2,027,979	2,025,186	+	2,793	Ord. Stk.	33½	13½	12	Nil	
	Buenos Ayres Western	1,930	22.10.38	45,720	-	1,488	17	635,793	770,162	-	134,369	"	34	114	9	Nil	
	Central Argentine	3,700	22.10.38	106,545	-	16,337	17	1,695,482	2,209,025	-	513,543	"	34½	105½	10	Nil	
	Do.	..	..	..	..	..	..	..	..	..	..	Dfd.	20½	4½	3½	Nil	
	Cent. Uruguay of M. Video	972	15.10.38	17,995	+	1,917	16	256,636	241,846	+	14,790	Ord. Stk.	67½	2	2	Nil	
	Cordoba Central	1,218	..	..	..	..	..	..	..	..	..	Ord. Inc.	64½	1½	3	Nil	
	Costa Rica	188	Aug., 1938	23,553	-	1,064	9	46,815	49,305	-	2,490	Stk.	38	27	24½	8½	
	Dorada	70	Sept., 1938	15,800	-	1,400	39	148,000	139,690	+	8,400	1 Mt. Db.	107	106	105	5½	
	Entre Rios	810	22.10.38	15,701	+	1,917	17	258,583	236,685	+	21,898	Ord. Stk.	197½	6	7	Nil	
	Great Western of Brazil	1,082	22.10.38	11,800	-	2,700	43	288,400	318,500	-	30,100	Ord. Sh.	34	1½	14	Nil	
	International of Cl. Amer.	794	Aug., 1938	\$363,798	-	\$46,862	35	\$3,818,615	\$3,954,618	-	\$136,003	..	..	1	1½	Nil	
	Interoceanic of Mexico	..	..	..	..	..	..	..	..	..	..	1st Pref.	2/-	18	12	Nil	
	La Guaira & Caracas	22½	Sept., 1938	6,210	+	1,745	39	46,880	47,665	-	785	Stk.	81½	6	8½	Nil	
	Leopoldina	1,918	22.10.38	26,244	+	4,349	43	887,535	994,884	-	107,349	Ord. Stk.	94½	3	2	Nil	
Mexican	483	21.10.38	\$215,800	-	\$41,300	16	\$4,204,000	\$4,853,500	-	\$649,500	"	17½	14	1½	Nil		
Midland of Uruguay	319	Sept., 1938	6,992	-	2,103	13	25,076	23,794	+	1,282	"	18	12	1½	Nil		
Nitrate	386	15.10.38	5,611	-	1,380	41	115,806	122,245	-	6,439	Ord. Sh.	31½	2	17½	5½		
Paraguay Central	274	15.10.38	\$2,884,000	+	\$255,000	16	\$47,871,000	\$51,064,000	-	\$3,193,000	Pr. Li. Stk.	84	791½	57½	5½		
Peruvian Corporation	1,059	Sept., 1938	64,805	-	25,148	13	212,547	263,674	-	51,127	Pr. Li. Pref.	145½	4½	4	Nil		
Salvador	100	15.10.38	\$9,218	-	\$4,157	16	\$172,986	\$190,534	-	\$17,548	Pr. Li. Db.	23½	100	22½	Nil		
San Paulo	153½	16.10.38	28,175	-	3,624	42	1,306,794	1,362,284	-	55,490	Ord. Stk.	98½	56½	38	10½		
Taltal	160	Sept., 1938	1,680	-	895	13	7,900	10,070	-	2,170	Ord. Sh.	17½	11½	16	Nil		
United of Havana	1,353	22.10.38	15,385	+	1,012	17	275,169	286,415	-	11,246	Ord. Stk.	58½	3½	5½	Nil		
Uruguay Northern	73	Sept., 1938	953	+	126	13	2,770	2,420	+	350	Deb. Stk.	10	2	2	Nil		
Canada	Canadian National	23,750	21.10.38	926,059	+	21,624	42	28,749,940	31,783,893	-	3,033,953	..	..	..	..	..	
	Canadian Northern	..	..	..	..	..	..	..	..	..	..	Perp. Dbs.	77	62½	68	5½	
	Grand Trunk	..	..	..	..	..	..	..	..	..	..	4 p.c. Gar.	1017½	94½	100½	4	
Canadian Pacific	17,186	21.10.38	729,200	+	70,000	42	22,338,000	23,006,000	-	668,000	Ord. Stk.	18	714	7	Nil		
Indian	Assam Bengal	1,329	30.9.38	50,070	+	6,778	26	695,684	657,947	+	37,737	Ord. Stk.	86	73½	76½	3½	
	Barsi Light	202	10.10.38	3,105	+	780	27	75,727	67,702	+	8,025	Ord. Sh.	66½	46	57½	6½	
	Bengal & North Western	2,116	10.10.38	68,704	+	8,608	2	68,704	60,096	+	8,608	Ord. Stk.	317	301	282	6½	
	Bengal Doonars & Extension	161	10.10.38	4,247	-	605	27	76,233	76,629	-	396	"	100	84	87½	7½	
	Bengal-Nagpur	3,268	10.10.38	157,125	-	44,863	27	3,560,738	3,646,387	-	85,649	"	101	89	93½	4½	
	Bombay, Baroda & Cl. India	3,085	20.10.38	235,575	-	6,975	28	4,719,450	4,795,050	-	75,600	"	113	110½	103½	5½	
	Madras & Southern Mahratta	2,967	30.10.38	132,525	-	686	26	2,752,735	2,637,577	+	115,158	"	110	105	104½	8½	
	Rohilkund & Kumaon	546	10.10.38	12,375	+	276	2	12,375	12,099	+	276	"	314	302	285	5½	
	South Indian	2,531½	30.9.38	125,926	-	814	26	2,106,532	2,109,670	-	3,138	"	103½	99½	102½	4½	
	Beira-Umtali	204	Aug., 1938	69,173	-	14,197	48	953,688	877,668	+	76,020	..	..	..	..	..	
Various	Egyptian Delta	620	30.9.38	6,638	-	1,069	26	103,698	110,839	-	7,141	Prf. Sh.	31/-	34	34	Nil	
	Kenya & Uganda	1,625	Aug., 1938	182,150	-	14,527	35	1,860,357	1,920,155	-	59,798	..	..	..	..	..	
	Manila	..	..	..	..	..	..	..	..	..	..	B. Deb.	48½	43½	43	8½	
	Midland of W. Australia	277	Aug., 1938	14,414	+	1,736	9	27,657	22,923	+	4,734	Inc. Deb.	98	93½	90	4½	
	Nigerian	1,900	10.9.38	28,362	-	17,809	24	694,910	1,133,403	-	438,493	..	..	..	..	..	
	Rhodesia	2,442	Aug., 1938	416,851	-	21,777	48	4,539,620	4,203,086	+	336,534	..	..	..	..	..	
	South Africa	13,263	8.10.38	605,779	-	31,531	28	16,865,039	17,473,991	-	608,952	..	..	..	..	..	
	Victoria	4,774	July, 1938	716,345	-	3,187	5	716,345	719,532	-	3,187	..	..	..	..	..	

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1½

† Receipts are calculated @ 1s. 6d. to the rupee      ‡ ex dividend

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading the amount being overestimated. The statements are based on the current rates of exchange and not on the par value



# Diesel Railway Traction

## L.M.S.R. Diesel Train Service

A RECENT journey on the 720 b.h.p. L.M.S.R. three-car diesel-hydraulic train (see issue of this Supplement for April 15 last), which went into regular service on September 12 on the Oxford—Bletchley—Cambridge line, demonstrated the extreme ease with which the schedule can be kept. The 16.1 miles from Bedford to Bletchley, including a signal stop for 46 sec. at Woburn Sands, took 19 min. 54 sec. (schedule 20 min.) with a maximum of 67.5 m.p.h., and a time of 2 min. 6 sec. for the first 1.3 miles from the Bedford start. Bletchley to Oxford (31.3 miles) took 33 min. 33 sec. with a maximum of 68.5 m.p.h., and Oxford to Bletchley 33 min. 26 sec. with a bad signal check at the conclusion of the run—schedule is 36 min. in each direction. The running was smooth and comfortable, and though the seating accommodation would probably be found somewhat cramped for long journeys the seats themselves are quite comfortable. But it is surprising, after the official pronouncements last spring on the impossibility of neglecting intermediate points between Oxford and Cambridge, that the diesel unit has been booked non-stop between Oxford and Bletchley and between Sandy and Cambridge, where some stops—at Bicester and Winslow, for instance—could be made without any increase in the overall times. The loading and popularity of the service might also be improved by more attention to connections; the 10.42 from Cambridge, for instance, just misses, at Bletchley, the principal morning service to the north, and at Oxford the diesel arrival at 6.0 p.m. and departure at 1.42 p.m. just fail to connect with important Great Western Worcester line services, with which there is a considerable interchange of traffic from east of Bletchley.

## A Record Investment?

A T a celebration on September 19 of the first anniversary of the introduction of the Rocket service of diesel-hauled express trains on the Chicago, Rock Island & Pacific Railroad, the chief executive officer, Mr. E. M. Durham, stated that in the first seven months of this year the five services of this type had shown net earnings of \$480,000 (£99,000), equivalent to a return of approximately 46 per cent. per annum on the original investment of \$1,800,000 (£370,000) for the equipment. In the seven-month period, the trains travelled 631,632 miles and carried 219,181 revenue passengers. All the Rocket trains are showing substantial earnings, but the best result was shown by the Des Moines Rocket, running between Chicago and Des Moines, Iowa, which earned a net revenue of \$176,000 (£36,000) in the first seven months of this year, equivalent to a return of 75 per cent. per annum on the money invested in that train. On this service the train covers the 358 miles between the two cities named at an average speed of 61½ m.p.h. in each direction daily. The final earnings for these trains in August had not been computed at the time of the anni-

versary celebrations, but the gross revenue for that month totalled \$149,998 (£30,800), equal to \$1.54 (76d.) a train mile, a figure which was better than that for any of the previous months, and well above the average of \$1.38 (68½d.) for the first seven months of the year. Some of these trains (described in the October 1, 1937 issue of this Supplement) are composed of three cars and the others of four cars, all of stainless steel construction, the respective tare weights being 118 and 148 tons. They are hauled by separate 1,200 b.h.p. 100-ton diesel-electric double-bogie locomotives, the power weight ratios being 5.5 b.h.p. per ton for the three-car sets and 4.85 b.h.p. per ton for the four-car trains. The services are between Chicago and Peoria, 161 miles (at 60 m.p.h.); Chicago and Des Moines, 358 miles (at 61½ m.p.h.); Twin Cities, Des Moines, and Kansas City, 493 miles (at 55 m.p.h.); Kansas City and Denver, 636 miles (60½ m.p.h. westbound and 52½ m.p.h. eastbound); and Fort Worth and Houston, 283 miles (at 56 m.p.h.).

## Fuel Conservation

THERE appears to be a widely-held opinion in these islands that one of the main objects of the industrial system, including the railways, is to use up our stocks of coal, and that that is one of the principal reasons why there are so few diesel railcars in Britain. If it did nothing else, the presidential address of Lieut.-Colonel J. H. M. Greenly before the Institute of Fuel was important because of the emphasis placed on the necessity of conserving our coal resources. It is mainly the great increase in the efficiency of coal burning in all types of power plants during the present century that has prevented the total consumption rising all too rapidly year by year, and actually the consumption is now almost stationary. By continuous research and experiment the coal consumption per kWh. in British power stations was reduced from an average of 2.53 lb. in 1925 to 1.54 lb. in 1935, that is, a reduction of 39 per cent. in ten years, and the improvement is still going on. Battersea power station, for example, consumes only about 0.95 or 0.96 lb. of coal per kWh. generated, equivalent to a thermal efficiency of 28½ to 29 per cent. Under more difficult conditions, diesel rail vehicles have shown a thermal efficiency at the rail in excess of 30 per cent., and the diesel engine itself a brake thermal efficiency of over 40 per cent. In Great Britain we are exhausting our coal stocks at the rate of 230,000,000 tons a year, and the world's annual consumption of petroleum is 250,000,000 tons. Nevertheless, it seems that the time has come when further intensive research into the possibilities of still greater efficiency in the burning of fuel is largely useless, for the benefits already produced by engineers and scientists are not being passed on to the public. The only object of an industrial system is to produce goods and services, but there is not much sense in labouring to improve the already efficient production methods of the 20th Century if the methods of distribution are still those of the 17th Century, or earlier.

## THE BRAKING OF HIGH-SPEED TRAINS

*With particular reference to brake shoe characteristics*

*(By a correspondent)*

**A**LTHOUGH in the retardation of trains the basic principles are the same in all countries, widely differing forms of mechanism are found, not all of which can be put down simply to varying conditions. Most remarkable of these differences, perhaps, is that just as European railways are giving up the drum and disc brakes for high-speed diesel trains and adopting clasp rigging with shoes applied to the wheel rims, the Americans are in the midst of doing exactly the opposite, the new Burlington Zephyr train under construction having a form of disc brake, whereas all other American diesel trains have had rim blocks.

Maximum braking forces up to 330 per cent. of the weight on the wheels at 90-100 m.p.h. have been tried in the U.S.A., although in regular service a limit of about 250 per cent. seems to have been set for speeds above 65 m.p.h., and retardation controllers are set to reduce this ratio in two or three steps to a value of 100 per cent. at 20 to 30 m.p.h. At speeds in the 100 m.p.h. range it was found that a reduction in the initial braking force from 175 to 135 per cent. increased the stopping distance by about 600 ft. A reduction from 175 to 100 per cent. added about 1,650 ft. to the stopping distance, so it is obvious that the braking ratios common a few years ago would be of not the slightest use for high-speed trains. All developments of high-speed brakes have the object of keeping the stopping distance within the present signal sections if possible, or at least of ensuring that the stopping distance does not increase in a greater proportion than the square of the speed.

### Drum and Disc Brakes

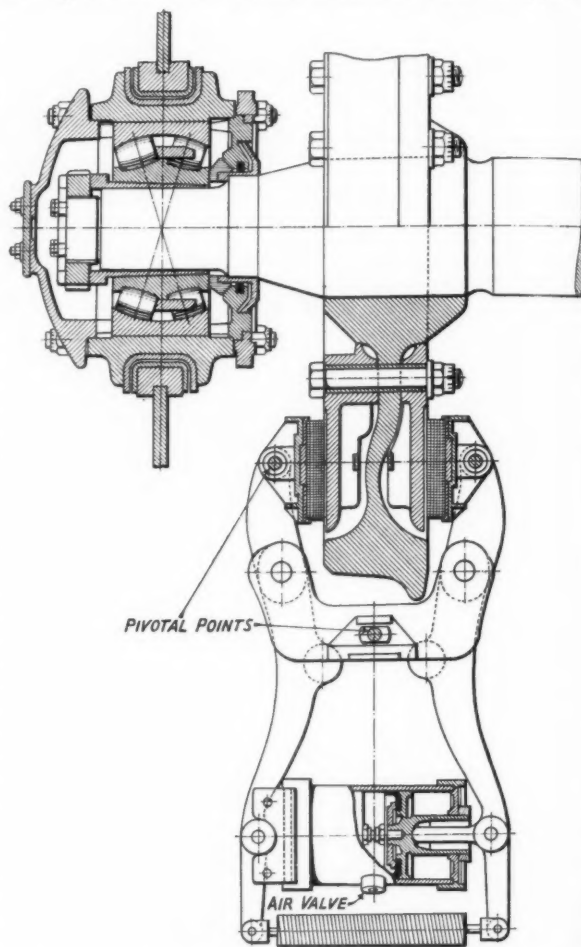
Wheel tread and brake shoe conditions appear to be the present limiting factor in the all-round efficiency of the brake equipment, and as these are due to the accumulation of heat from the brake block pressure it is obvious that the lighter the weight of the train the easier is the problem of heat dissipation. This is so whether the brakes are of the drum type or have the usual blocks on the wheel treads. It is principally the problem of adequate heat dissipation which has caused serious difficulties with the drum type of brake, for the wheel diameter and gauge prevent big enough dimensions to take up the momentum of the train without excessive pressures, leading to high temperatures and deformation.

In an effort to increase the heat-dissipation qualities, a move has been made, more particularly in Germany and Holland, towards the use of a disc brake, in which the rolled steel wheels have large circular discs on the inside and outside, to which are applied by pincers mechanism four shoes per wheel. With this system the heat produced is not fed into an annular body, as in the drum brake, but to two flat discs which have a large surface exposed to the atmosphere. Nevertheless, cast-iron brake blocks on the wheel rims have been adopted for the latest three-car high-speed diesel trains of the German State Railway, although the average axle load in the fully-laden condition is only 14½ tons compared with 17 tons on the previous three-car articulated trains fitted with drum brakes. The Hildebrand-Knorr compressed air brake in these installations has electric retardation control which gradually reduces the maximum force of 200 per cent. of the tare weight, but from 37 m.p.h. downwards a pendulum type

of retardation controller comes into operation to ensure that the braking force does not exceed 80 per cent.

### Brake Shoe Friction

Early tests with the Burlington Zephyr showed that brake shoe friction decreased in a fairly uniform manner from the lowest to the highest speeds, and that there was no major reduction in adhesion at super speeds, but the heat generated was a serious factor and with full-applica-



*Arrangement of disc brake as used on the Netherlands Railways*

tion stops from 90-100 m.p.h. molten brake shoe metal frequently adhered to the wheel. Recent tests conducted at the University of Illinois, and described in that university's bulletin No. 301, tend to modify the Zephyr results, in that with brake block pressures above 14,000 lb. the coefficient of friction of the shoes tends to rise, and this is particularly marked at speeds of the order of 100 m.p.h. Throughout the whole speed range the coefficient of friction was lower when heavy shoes were used.

All the shoes used had reinforced steel backs; the heavy shoes weighed 25 lb. when new and the light shoes 20 lb.

Over 400 stops were made in the course of the University of Illinois tests; the shoe pressures ranged from 4,500 to 20,000 lb., and with each pressure stops were made from equivalent speeds of 60, 80, and 100 m.p.h. Below a combination of 65 m.p.h. and 15,000 lb. shoe pressure, the average coefficient of friction during a stop decreased as the initial speed and shoe pressure increased. Above this combination there was a softening of the shoe surface which allowed the shoe to fit itself better on the wheel, with a corresponding decrease in unit bearing pressure and an increase in the coefficient of friction, but the softening of the surface greatly increased the shoe wear per stop under combinations of high speed and pressure. It was felt that if excessive wear and deterioration of brake shoes were to be avoided, no cast-iron shoe should be subjected to braking conditions in excess of the performance and dissipation of 90,000 ft. lb. of work a second. Molten metal on the wheel treads could be avoided, apart from odd flakes, by limiting the retardation conditions to combinations of speed and pressure in which the work-rate of performance of the shoe was below 70,000 ft. lb. per sec.

Investigations have been made in France with shoe pressures up to 6,000 lb. and showed that at a speed of 87 m.p.h. the coefficient of friction varied almost as a straight line law from 19 per cent. at a shoe pressure of 2,850 lb. to 14 per cent. at a pressure of 6,000 lb. At 62 m.p.h. the coefficient rose from 20½ per cent. at 2,650 lb. shoe pressure to 21 per cent. at 3,300 lb., and then fell to 19½ per cent. at 4,700 lb. and to 17 per cent. at 6,000 lb. At 50 m.p.h. the shape of the curve was the same as that at 62 m.p.h., but for the same block pressures as given for that speed the values of the coefficient of friction were respectively 22½, 23½, 22, and 18½ per cent.

The Illinois University tests also included an examination of the variation in the coefficient of friction during a stop, and it was found that with shoe pressures below 16,000 lb. there was a definite increase in the coefficient of friction beginning at a point where the speed had decreased to approximately 35 m.p.h., and continuing to the end of the stop. At pressures above 16,000 lb. the coefficient was fairly uniform during the entire stopping period, with the exception that during stops from an initial speed of the order of 100 m.p.h. the coefficient of friction was high at the beginning and rose again temporarily when speed had decreased to the neighbourhood of 60 m.p.h.

#### Tread Cracks

With a number of normal stops beforehand, the application of braking forces of 125,000 ft. lb. per sec. or more during the University of Illinois tests almost invariably resulted in cracks forming on the tread of the tyre. Some of the cracks formed were 3½ in. long and attained a maximum depth of ¾ in. Brake shoe pressures of 20,000 lb. combined with a high speed are necessary before such a work rate is attained. In general, the cracks occurred during the cooling of the wheel after a stop, but as forced air cooling was used the cracking was perhaps not altogether surprising.

Considerable shoe temperature variations were recorded, but as only two thermo-couples per shoe were used it was found impossible to give a value indicating the average. The temperatures recorded appear to have been governed by the actual bearing area of the shoe on the tread, and under certain conditions almost fantastic temperatures, up to 1,155° F., were recorded for particular spots on the shoe. Despite the fact that the surface of the 33-in. wheel used sometimes became red hot, thermo-couples sunk ⅝ in. below the surface of the tread did not register

a higher temperature than 380° F. In the earlier Burlington Zephyr tests tread temperatures up to 480° F. were registered in stops from 100 m.p.h., but in general the values were not higher than 350° F. It will be realised that in the University of Illinois tests the set had no cooling effect such as would be obtained from the linear speed of a train running on a track.

#### Special Shoes and Shoe Layouts

In order to reduce the wide range of frictional values at different speeds, one of the American brake shoe manufacturers has developed a shoe with carbon inserts comprising about 13 per cent. of the wearing surface, in order to reduce the surface temperature and thus increase the



Diagram showing relation between coefficient of friction and brake shoe pressure at three different speeds as determined by the University of Illinois tests

coefficient of friction at high speeds. But the latest University of Illinois tests would seem to show that if shoe pressures above 14,000 lb. are used such inserts would be of little value, because due to the increase in temperature the coefficient of friction then begins to rise at most speeds. Nevertheless, carbon inserts may reduce the rate of block wear, which is one of the greatest disadvantages of high pressures. Under present conditions it seems that block pressures in excess of 12,000 lb. can hardly be used for everyday service.

Blocks lined with asbestos composition have been tried on various sections of the French National Railways, with the object of making use of the constant coefficient of friction of such material on steel with given wheel adhesion conditions. But if the rail is wet the coefficient of the friction lining is considerably reduced, and efforts are being made to produce a material in which the variation in the coefficient of friction will change more or less in accordance with the adhesion, which may vary between 5 and 40 per cent. Two-part articulated blocks have been tried on heavy high-speed vehicles of the French National Railways; the lower portion of the block is of cast iron and removes most of the water from the tread before the upper, or friction-lined, portion of the block is reached. Two articulated blocks a wheel are fitted.

A high standard of brake equipment maintenance is essential with high-speed trains, because with any appreciable variance in the conditions of the shoes and wheels

(continued on page 765)



## Introduction of Diesel Traction in Uruguay

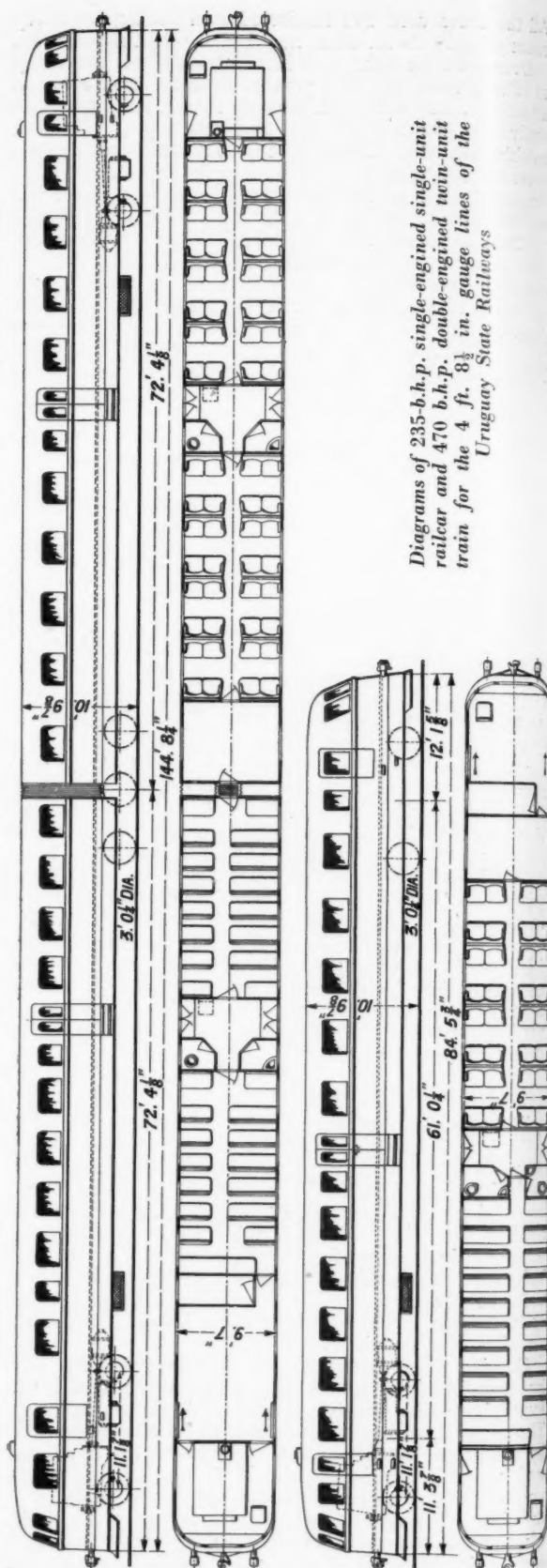
FOR a number of years the Uruguay State Railways have used petrol-engined single-unit railcars of American design on their standard gauge system, but in 1936 the pressing need for still more economical operation led to tenders being called for a fleet of single-unit and twin-car diesel trains, and after the receipt of tenders from builders throughout the world an order for 10 railcars and five twin-car trains was placed with Ganz & Co., of Budapest, and these vehicles have now all been delivered.

An essential requirement was that all units should have an appreciably greater carrying capacity than the existing 60-70-seater petrol cars, and in the new railcars this led to an interesting problem in design, because the extra length which such a stipulation necessitated had to be obtained despite a very rigid limitation as to maximum axle-load, so that the cars might be used on all lines. Originally the limit fixed was 12 metric tons, but later this was increased to 12.3 metric tons. Moreover, curves on the line made it necessary to limit the rigid wheelbase to 3.4 m. (11 ft. 2 in.) and this involved widely-spaced bogie pitch, leading to a greater body weight than would otherwise have been necessary.

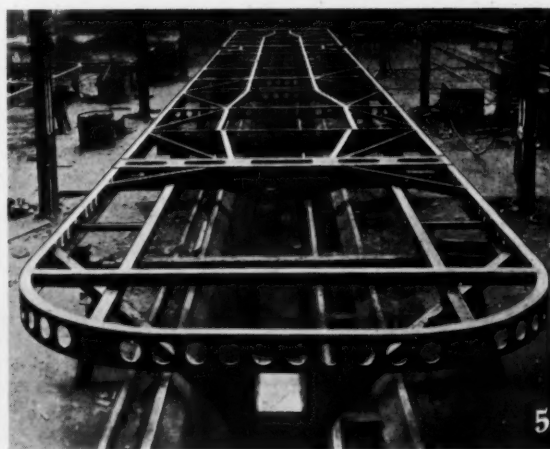
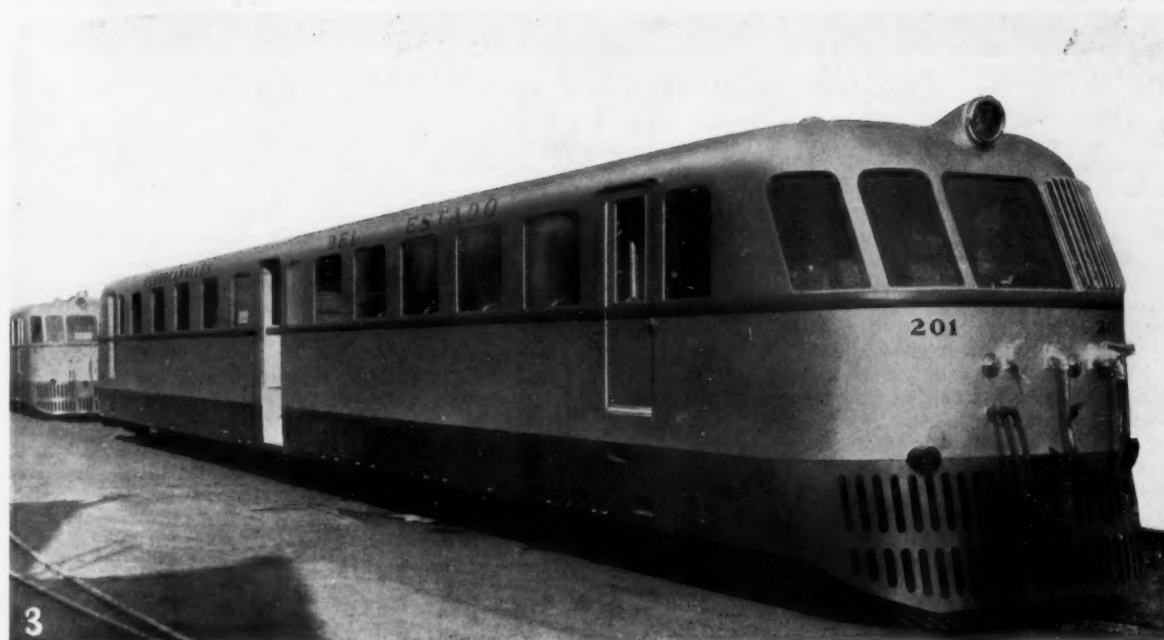
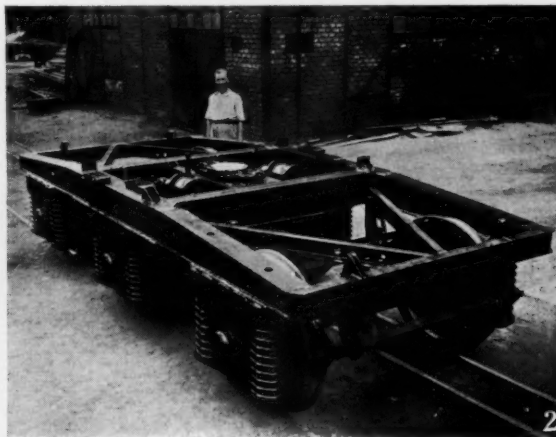
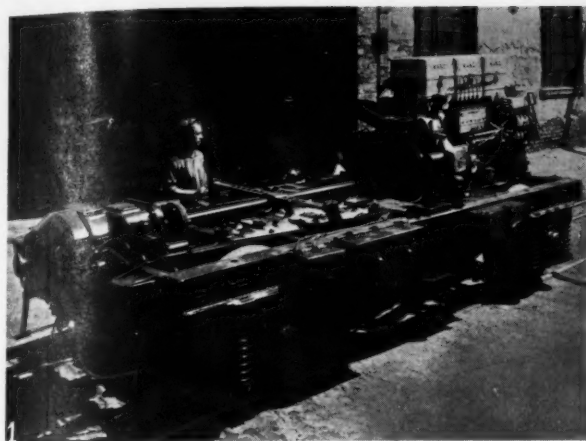
These problems have been met in a way which not only ensures good riding and operating characteristics, but meets all requirements as to weight and seating. The single-unit railcar has 32 first class and 50 second class seats, together with buffet, lavatory, luggage, and mail accommodation, on a length of 84 ft. and a tare weight of 30 tons; the twin-car trains have 64 first class and 76 second class seats, along with buffet, lavatory, postal, and baggage accommodation, within a length of 145 ft. and on a tare weight of 55½ tons. The fully-laden weights are 40½ tons for the single-unit railcar and 73 tons for the twin-car train. The railcar is powered by a single engine set to a maximum of 235 b.h.p. and the trains have two such engines. The power-weight ratios thus are 7.85 b.h.p. per ton of tare and 5.8 b.h.p. per ton of gross weight for the railcar, and 8.5 b.h.p. and 6.45 b.h.p. per ton for the twin-car trains. The top speed of both types of vehicle is 100 km.p.h. (62 m.p.h.), and the actual acceleration is above the specified value of 1 km.p.h. in 60 sec. from a standing start.

### Motive Power

The bogie-mounted engines used are of the well-known Ganz-Jendrassik VIJaR170/240 type. As this model has been described more than once in these pages, notably in connection with the Metro-Cammell-Ganz railcar in England (see issue of this Supplement for July 9, 1937), brief particulars will suffice. The six cylinders have a bore and stroke of 170 mm. by 240 mm. and at the maximum power in this installation of 235 b.h.p. at 1,250 r.p.m. the brake m.e.p. is 81 lb. per sq. in. and the piston speed 1,800 ft. per min. The weight is about 4,750 lb., corresponding to 20 lb. per b.h.p. The maximum possible output of this type of engine is approximately 310 b.h.p. at 1,450 r.p.m., so that the setting of 235 b.h.p. at 1,250 r.p.m. gives a reserve sufficient to prevent an unduly short engine life. The crankcase is a single light alloy casting, and above it are carried three cylinder blocks of cast iron, each casting comprising two



Diagrams of 235-b.h.p. single-engined single-unit railcar and 470 b.h.p. double-engined twin-unit train for the 4 ft. 8½ in. gauge lines of the Uruguay State Railways



(1) Driving bogie, carrying 235-b.h.p engine and five-speed transmission. (2) Six-wheeled articulation bogie of the twin-car trains. (3) One of the 235-b.h.p. single-unit railcars. (4) Interior of one of the second class saloons. (5) Underframe assembly of one of the cars of a twin car-train

VIEWS OF THE GANZ RAILCARS AND RAILCAR TRAINS, URUGUAY STATE RAILWAYS



One of the twin-car Ganz diesel-mechanical trains of the Uruguay State Railways

cylinders. Both shaft and pins of the balanced alloy steel crankshaft are hollow-bored. The fuel-pump is of the Ganz-Jendrassik type and is operated by a train of gears which also drive the governor and cooling water pump. The cooler for the lubricating oil is mounted on the engine and round it is circulated the engine cooling water.

A five-speed mechanical transmission of the usual Ganz type is incorporated, but in view of the strict limitations as to the car weight, detailed attention was paid to the lightening of all the constituents in order to take away metal where no stress existed, and to increase the stresses somewhat by means such as hollow-boring the gear shafts, thereby gaining a large relative amount of weight with but a slight increase in the stresses. Rings of circular holes have also been drilled in the gear wheel blanks.

The arrangement of the transmission is similar to that on the majority of Ganz railcars. In view of the limitations in axle-loading, the engine has been mounted as near the bogie pivot as possible, thus helping to equalise the loads on the two axles. From the engine a long cardan shaft with Hardy-Spicer flexible couplings at each end leads to the main clutch and reversing gears, which are mounted in a casing supported through rubber cushioning blocks on the transoms at the inner end of the bogie frame structure. The driving shaft is connected through spur gears to the multiple-disc Ferodo-lined main clutch, and from the spur gear reverse mechanism a short cardan shaft leads to the five-speed gearbox; thence the drive is taken from the inner end of the gearbox through two further cardan shafts, one leading to each of the axles, on which are bevel gear drives. These last shafts have flexible rubber disc couplings of the Hardy type, and the spiders are made of drop-forged steel in place of the steel castings used in previous applications, thus allowing a reduction in weight.

Five pairs of casehardened nickel-chrome steel spur gears are included in the gearbox, which, like the engine, is supported on the bogie frame structure through the intermediary of rubber cushioning blocks. One gear wheel of each pair is permanently fixed to its shaft, and the other runs free but may be locked to the shaft by means of a multiple-disc friction clutch (one to each pair of gears), which is actuated by its own electrically-controlled air cylinder outside the gearbox; the contrary declutching is effected by the action of a spring in the air cylinder when the latter has been opened to the atmosphere. All the

gears and clutches run in oil, and all the shafts are carried by ball or roller bearings. The main clutch and reversing gears also are operated electro-pneumatically, and have their own control cylinders on the casing. The casings of the gearbox, axle drives, main clutch, and reversing gears are all of light alloy. Torque rods of steel channel section are secured to the axle drive casings and transmit the reaction to the bogie frame structure through helical steel springs.

From the secondary, or driving, side of the main clutch a cardan shaft drive is taken to provide the power for the radiator fans, brake compressor, lighting dynamo, and other details which are located on a separate auxiliary frame carried below the car underframe, from which the ensemble is slung through flexible supports. The driving shaft has all-metal cardan joints. In the twin-car trains each car has its own independent set of auxiliaries driven from the engine of that car.

#### Mechanical Portion

The bogies are of the usual Ganz non-bolster type, and are built up of all-welded alloy steel. The suspension is entirely through helical steel springs with rubber cushioning blocks, and with similar blocks beneath the bogie centre pivot. Roller bearings axleboxes of the Fischer type are used, and a short equalising lever connects them to the helical spring group on each side. Both axleboxes and springs are directly below the centre of the main longitudinal side girders of the bogie frame, and there is thus no bending moment introduced in the transference of the load, either in the spring load or in the axlebox guide thrust. Both driving, trailing, and articulation bogies of the railcars and trains have a wheelbase of 3.4 m. (11 ft. 2 in.), although the articulation bogie, to cater for the maximum axle load of 12.3 tonnes, is of the six-wheeled type. In each case, too, the disc wheels are of 920 mm. (36½ in.) diameter. In order to provide an easy passage of the articulation bogie through curves, the central wheels are flangeless and have parallel treads; they take no part in the guiding and are used simply as weight carriers. The superimposed load on this bogie approximates to 9 tons from each car body when in the fully-loaded condition. As with the driving and trailing units the compressed air brake gear, including the cylinders, is all carried on the bogies with the exception of the reservoirs, which are located beneath the underframe.

Chrome steel with an ultimate tensile strength of about



38 tons per sq. in. is used for the all-welded skeleton framing of the body. The side framing, roof members, underframe portion, and the side and roof sheets are formed as an integral girder, every portion of which carries its due share of the load, and thus assists in obtaining adequate strength with minimum weight. Standard profiles are used for parts of the structure, and plates and pressings for the remainder. Compared with the Ganz normal practice for frame design, drilling of lightening holes has been carried out on the main longitudinal and cross members of the sub-floor portion, as may be seen from the illustration showing the assembly of an underframe of one of the articulated cars.

Light metal has been used extensively for the interior fittings and for such details as the doors and window fixtures. The floors, cross partitions, and inner side panels

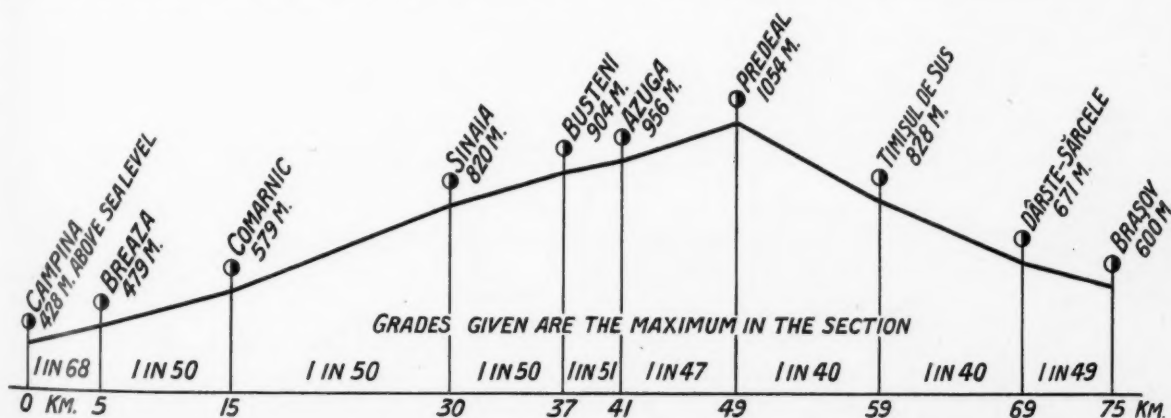
are of plywood. Installed in the driving compartment at each end of the train or railcar is a sufficiency of instruments to enable the track speed, engine speed, cooling water and oil temperatures, battery voltage, and brake air pressure to be read, and the fittings include a fuel regulation lever, change-speed gear handle, reversing handle, gear step selector push buttons, engine starter button, double revolution counter, double distance thermometer, double voltmeter, speedometer, button for instrument lights, button for signal bell, indicating light for dynamo charging, indicating light for position of reversing gear, warning horn operating button, window wiper and switch, driver's brake valve and stop-cock on air pipe line, air brake gauges, and swivelling control for the searchlight which is carried above the driving window at each end of the train.

## Roumanian Main Line Locomotive Performance

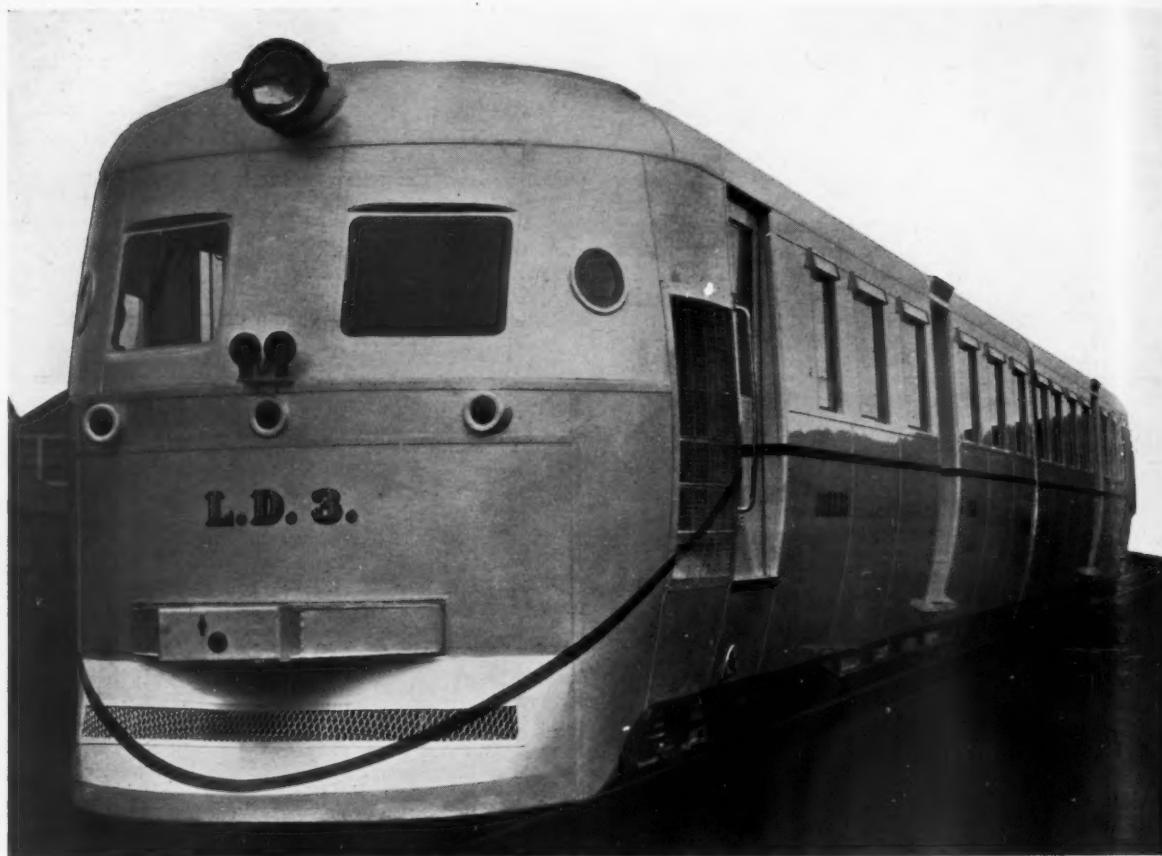
### Mountain line service

THE diesel-electric locomotive of 4,400 b.h.p. supplied by Sulzer Bros., of Winterthur, to the Roumanian State Railways, was fully described in the issue of this Supplement for June 10 last, at the time it was finishing its running trials in Switzerland. On June 16 the locomotive was handed over to the Roumanian State Railways, and on July 5 comprehensive tests were begun over the Bucharest—Campina—Brassov main line, for which the locomotive had been specifically designed. So well did it perform, that after eight consecutive days of testing the authorities took over the locomotive without any further reserve, and on July 20 it was introduced into regular service. It will be recollected that the Bucharest—Ploesti division, 37 miles long, is fairly level, although with a gradual rising tendency out of Bucharest, but from Ploesti to the summit of the line at Predeal is continuously uphill for the 52 miles, culminating in grades of 1 in 48-50. Thence downhill to Brassov the grades are 1 in 40 and 1 in 50 over the distance of 16 miles. With a trailing load of 500 tons the fuel consumption over return trips averaged 22.9 lb. per ton-mile gross (that is, for a total train weight of 730 tons) and 33 lb. per 1,000 trailing ton-miles. With a trailing load of 600 tons the consumption was reduced to 22.2 lb. per gross 1,000 ton-miles and 30.7 lb. per trailing 1,000 ton-miles; the lubricating oil consumption averaged 0.7 lb. per 1,000 gross ton-miles. Each day the locomotive makes one return trip

between Bucharest and Brassov, 212 miles, with a fast train weighing 500 to 600 tons. This load is appreciably greater than that of the international trains over the same route, although the speed is nearly as great, and as the stops are more frequent such trains form a greater test of the locomotive's capabilities than the international services. Normally, on express trains of 600 tons weight, one express steam locomotive is used from Bucharest to Campina; two or three steam locomotives of lower speed from Campina to Predeal; and one steam locomotive from Predeal to Brassov. On the return trip with a similar train weight, three or four steam locomotives have to be used up the sharply-curved 1 in 40-50 bank from Brassov to Predeal, and one locomotive, with a change at Campina, thence to Bucharest. As the diesel locomotive runs right through from Bucharest to Brassov and back, shunting of locomotives is obviated at five stations, the smoke nuisance in the tunnels is eliminated, the labour charges are very considerably reduced, and the general operation of the line improved. The fuel oil tanks have a capacity more than sufficient for two round trips. At the moment the locomotive is kept out of service for one day a week for inspection and light repairs, but as experience is gained there is little doubt that the mileage and time in service will be increased. Up to the end of August the locomotive had run 10,600 miles, of which about 1,100 miles had been made in Switzerland.



Profile of the Campina—Brassov section of the Bucharest—Hungary route, Roumanian State Railways



## ARTICULATED TRAINS FOR ARGENTINA

*English-built twin-car sets for a variety of passenger and freight traffic*

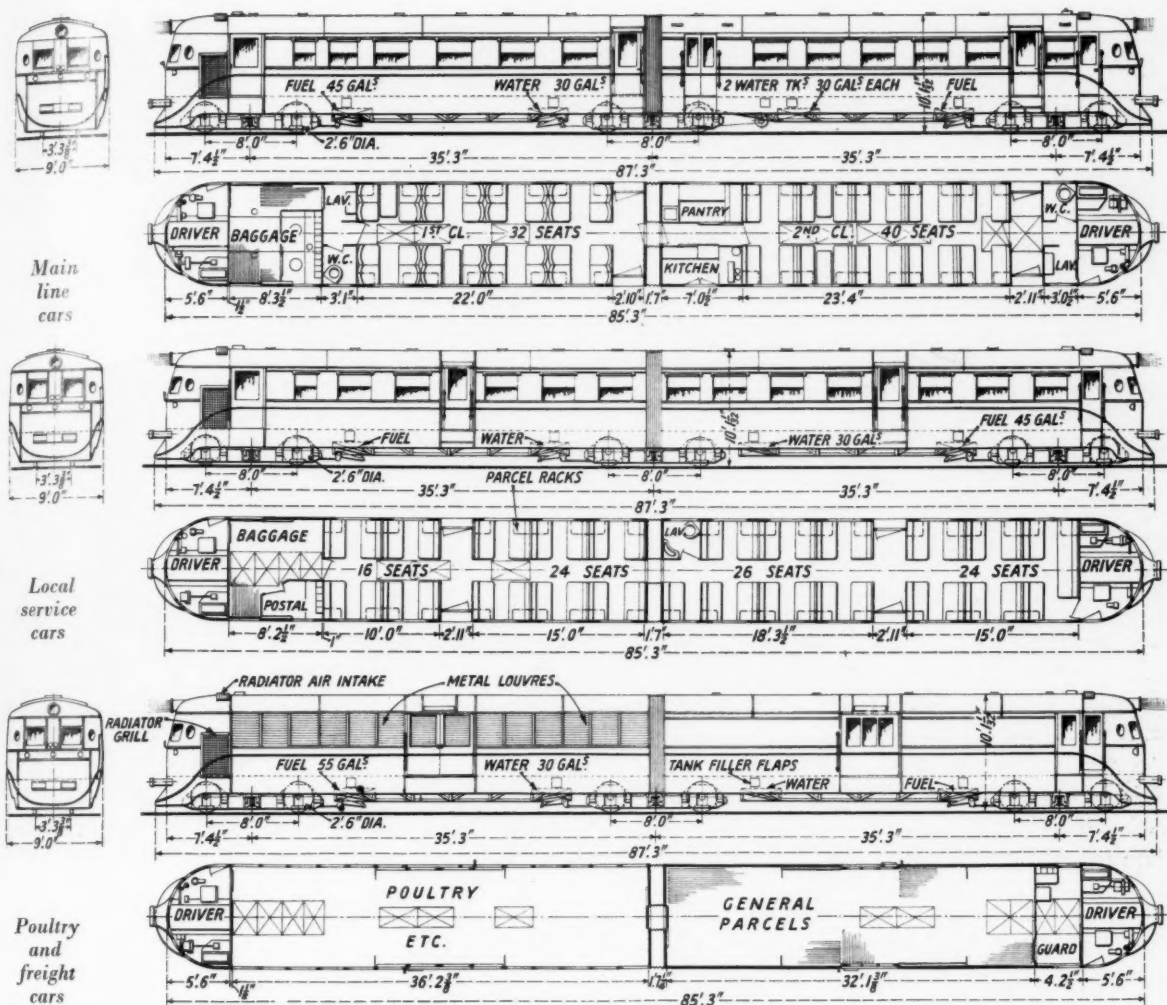
**A**MONG diesel railcar orders in course of delivery from English firms are ten twin-car sets with mechanical transmission, built by the Birmingham Railway Carriage & Wagon Co. Ltd. for the Buenos Ayres Midland Railway, a 320-mile metre-gauge line operated jointly by the Buenos Ayres Great Southern and Buenos Ayres Western Railways. All ten sets are the same in motive power and transmission equipment and in the mechanical design, but two are intended solely for parcels and poultry traffic, four are for local passenger traffic, and four are for long-distance passenger services. The interior layouts thus are different, as may be seen from the three floor plans reproduced with this article. The local trains have 90 seats in one class, a luggage room, postal compartment, and lavatory. The long-distance trains have 32 first class and 40 second class seats with tables between, a small kitchen and pantry, and luggage, postal, and lavatory accommodation. The freight trains have one car devoted to the carriage of parcels and light goods, and the other is laid out for poultry traffic.

The weight of the local trains, empty but with supplies, is  $28\frac{3}{4}$  tons, and that of the long-distance trains about the same. With a full complement of passengers and luggage the gross weight of these sets is about  $36\frac{1}{2}$  tons, and the maximum axle load  $6\frac{3}{4}$  tons. The freight cars have a smaller tare weight than the passenger sets, but owing

to the large carrying capacity the gross weight is about 45 tons, the paying load being approximately 20 tons. This great difference between empty and loaded weights has necessitated the proportions of the springing system being different from those of the passenger vehicles. As the engines at each end of the car have an output of 100 b.h.p., there is 7 b.h.p. per ton of tare available and 5.6 b.h.p. per ton of gross weight; in the freight cars the corresponding figures are 8 and 4.5 b.h.p. All cars have a maximum designed speed of 55 m.p.h. with full engine revs.

### Engine and Transmission

At each end of the car is a Gardner 6LW engine, and with it a Vulcan-Sinclair fluid coupling and a Wilson epicyclic gearbox; but in contradistinction to so many of the applications of this well-known power-transmission combination, the constituents are mounted on the car underframe and not on the bogie. The drive from the gearbox is taken down at an angle, through Layrub cardan shafts, to the inner axle of each end bogie, where there is a spiral bevel reverse gear and final drive made by David Brown & Sons (Huddersfield) Ltd. This drive is set with its longitudinal centre line  $2\frac{3}{4}$  in. off-centre of the axle, and with the driving shaft 8 in. above the axle centre line. The engine, coupling, and gearbox are



Diagrams of the three types of diesel-mechanical trains

mounted on a part of the underframe which is secured by driven bolts to the main portion, and by loosening these bolts and taking off a similarly fitted buffer beam structure, the power-transmission equipment and its supporting frame can be withdrawn *en bloc* from the end of the vehicle. The engine projects through the floor of the engine room, and access can be obtained to the transmission through trap doors in the floor of the luggage compartment.

Cylinders of 4 1/4 in. bore by 6 in. stroke are incorporated in the Gardner 6LW engine, and the maker's figure for maximum output at the top normal speed of 1,700 r.p.m.

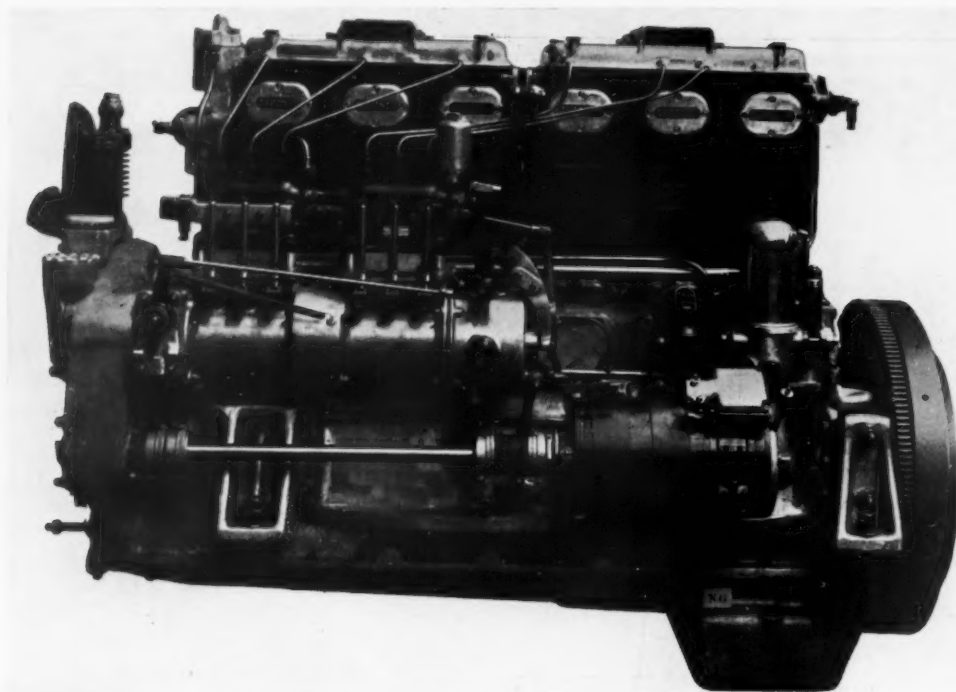
is 102 b.h.p. Over the full working range of speed and power the fuel consumption is below 0.4 lb. per b.h.p.hr. The cylinder blocks are cast in threes, of a special iron, and are bolted to a single-piece aluminium alloy crankcase; steel bridge plates extend across the crankcase and carry the main bearings. Hardened dry-type liners are inserted in the cylinder barrels and the heads are cast of iron in blocks to correspond with the cylinder castings. C.A.V.-Bosch fuel injection pumps are used, and also a C.A.V.-Bosch 24-volt starting motor. The engine-driven dynamo is of Stone's Tonum type, 8 in. in diameter.

Air is drawn in to the engine through a special filter



One of the local service twin-car trains of the Buenos Ayres Midland Railway





*Gardner 6LW oil engine developing a maximum of 102 b.h.p. at 1,700 r.p.m., as installed at each end of the Buenos Ayres Midland Railway diesel trains*

made by the Sphinx Sparking Plug Co. Ltd. The cooling water and lubricating oil radiator, made by the Spiral Tube & Components Co. Ltd., is mounted on one of the side walls of the engine room; the cooling air is drawn into the engine room through louvres in the roof and expelled through the radiator elements by a fan belt-driven from the front of the engine crankshaft. The same belt drive system is extended to provide, at one end of the train, the power for an exhauster, and at the other end the power for a compressor. A Vokes pipe line filter is fitted to the exhauster. Over the engine is a thin metal casing fitted with Insulwood. Supported on the car under-frame is a 45-gal. fuel tank for each engine; in view of the heavier weight and the different duties, this capacity is raised to 55 gal. per tank on the freight unit. Each car also has a 30-gal. water tank slung below the floor.

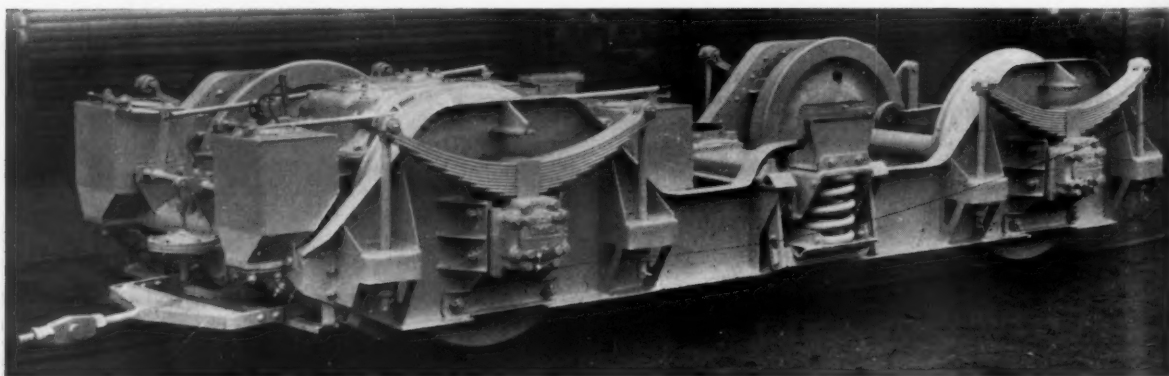
The Wilson gearbox is of the four-speed type with electro-pneumatic control, and was made by Daimler to the designs and requirements of the Self-Changing Gear Trading Co. Ltd. The four speed steps have ratios of 4.15, 2.36, 1.56, and 1.0 to 1, and the final drive ratio

is 2.68 to 1; the corresponding track speeds are 13, 23, 35, and 55 m.p.h. The box itself is of an aluminum alloy.

#### Bogies

Welded steel construction has been used for the bogies, all of which run on 2-ft. 6-in. wheels spread over a base of 8 ft. The articulation bogies of the local and long-distance sets are the same as the power bogies except that the final drive and sanding gear are omitted, and that the centre pivot, side bearers, and certain brake gear details are slightly modified. High-elasticity steel is used, and the side frames are  $\frac{1}{4}$ -in. pressings with a  $3\frac{1}{2}$ -in. flange along the bottom edge and a 3-in. by  $\frac{1}{4}$ -in. stiffening angle riveted along the top edge. The centre transoms are of  $\frac{1}{8}$ -in. plate and the outer transoms of  $\frac{1}{2}$ -in. plate; further welded strengthening plates are provided to take up the forces at the axlebox guides and spring hanger brackets, and two subsidiary transoms are located between the centre cross-members and the wheels.

The welded bolster is of  $\frac{3}{8}$ -in. plates and has a depth



*Welded steel Birmingham driving bogie; the axle drive and reversing gear can be seen on the left-hand axle*

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of 6½ in. In order to give steady riding it is extended transversely through the side frames and the double helical springs are pitched at 5 ft. cross centres. Further out again are the side bearers, which are supported on welded steel brackets built up from the top plate of the bolster. The swing links are set with a slight outward rake from top to bottom and have a length of 10 in. Semi-elastic packing is inserted between the bolster and the bogie pivot castings and the side bearers.

Disc wheels are used, and they are forced on axles carried in Timken roller bearing axleboxes with a journal diameter of 4 in. Each box is supported by an independent laminated spring of ten 3-in. by ¾-in. plates 3 ft. between the hangers when in the loaded position; the deflection is ¾ in. per ton and the superimposed load per spring in the driving bogies is 3 to 3¼ tons. Spencer-

body framing shares in carrying the load, the underframe portion was designed to take the whole load without assistance. The underframe has two outer main solebars and, between the girder frames at the ends which carry the engine-transmission combination, a single central member of varying cross-section. The solebars are of 3-in. by 3-in. by ⅝-in. angles and are supported between the bogies by a girder form of truss, which incidentally provides a convenient method of supporting various items of equipment. As with the bogies, the framing is constructed of high-tensile copper-bearing Kupplus type of steel with an ultimate strength of about 38 tons per sq. in. A copper-bearing c.r.c.a. steel is used also for the side panel and roof sheets, and these are covered on the outside with Docker Brothers' aluminium paint.

Roberts's asbestos spraying has been applied as insula-

*Interior of one of the metre-gauge local service diesel-mechanical trains built by the Birmingham Railway Carriage & Wagon Co. Ltd. for the Buenos Ayres Midland Railway to the inspection and requirements of Messrs. Livesey & Henderson, the railway company's consulting engineers*



Moulton rubber auxiliary springs are fitted between the spring hangers and their brackets. In the articulation bogie the side bearing springs have 13 plates of the same dimensions, and the deflection per ton is ⅞ in.; the bolster helical springs of that bogie are of the triple type, and have a deflection per ton of ¾ in. compared with the ⅞ in. of the double springs of the driving bogie bolsters.

Automatic vacuum brakes are incorporated, with one 18-in. cylinder for each bogie. The cylinders are mounted on the car underframes and through adjustable rigging of the usual type apply one block to each wheel. On the driving bogie the blocks are arranged on the sides of the wheels nearest the outer end of the car, and the blocks on the articulation bogie are located in a similar manner. All the vacuum brake equipment and also the vacuum sanding apparatus, which applies sand to both sides of each driving wheel, was supplied by G. D. Peters & Co. Ltd. Embodied in the car is a passengers' alarm brake, which in addition to applying the blocks also shuts off the fuel supply from the engine. A hand brake in each driving compartment operates on the adjacent bogie only.

#### Framing and Body

The body and underframe are constructed separately by welding and are riveted together, and, although the

tion to the inside face of the panel sheets. The inside panels themselves are of Sundeala. The flooring consists of corrugated steel sheets overlaid, in the passenger cars, with a layer of Nonpareil cork and then with a layer of Spencer-Moulton rubber flooring, coloured mottled brown in the local cars and in the second class saloon of the long-distance cars, and mottled blue in the first class portion. In the parcels car the floor consists of 1½-in. by ½-in. slats on ⅝-in. tongued and grooved boards laid on ¾-in. dovetail sheeting, and in the poultry car the slats are omitted. Both parcels and poultry cars have wide sliding doors with Ferodo guide strips on the bottom, and along the sides of the poultry car are metal ventilating louvres.

A plain teak colour of painted and varnished finish has been adopted for the interior of the luggage and postal compartments of both types of passenger vehicles. Brown and cream finish, in Docker Brothers' paint, has been adopted for the passenger saloon interiors of the local cars and the second class portion of the long-distance sets, but in the first class portion the finish is blue and cream. These colour schemes are extended to the seat coverings, which are of blue buffalo hide (first class) and brown Rexine (second class). The seats themselves are non-reversible and are of the light-weight type made by

G. D. Peters & Co. Ltd.; they are mounted on light alloy pedestals. The vertical grab rails, outer fittings and certain other details are of stainless steel and were supplied by J. D. Beresford & Co. Ltd. Alpax light alloy doors are fitted to the passenger saloons and driver's compartments, and those of the sliding type have Crittall runners; aluminium alloy is used also for such details as the parcel racks. In the long-distance cars the kitchen and pantry have Alpax doors. All the windows in the saloons, lavatories, and postal compartment are of Rawlings' PYP half-drop type and the winding handles are fitted with a neat clutch arrangement which prevents strain should a passenger try to lower the window too far. Peters' Windsor-type roller blinds are fitted. Fixed lights are embodied in the doors.

Heating of each passenger saloon is effected by the cooling water of the engine installed on that car, and Burlington heaters are placed under certain seats. Ventilation is assured by Colt extractors in the roof, supplemented in the long-distance cars by Stone's Imperiston fans. The complete lighting equipment is of Stone's Tonum type, with 15-watt 24-volt lamps arranged down the ceiling in two circuits and fed from a 19-cell Alconum-nickel battery slung below the underframe and topped up through trap doors in the car floor. There is a drinking water supply in a small alcove against the lavatory and this is equipped with a Doulton house-pressure filter; the

supply is from a 30-gal. tank in the roof. The two cars of a set are connected together above the articulation pivot by inner and outer canvas bellows.

In the long-distance sets a more comprehensive electric installation is necessary in order to cater for the requirements of the kitchen. Here again Stone's equipment is used, and from the same axle on the kitchen car are driven by Brammer belts two Tonum 48/56/60-volt dynamos; a 38-cell 48-volt Alconum-nickel battery is fitted below the floor. The kitchen fittings supplied by J. Stone & Co. Ltd. include a 10-in. electric Still boiler, pressure-regulated, a 2-gal. coffee machine, a steam injector for milk heating, and a switchgear and fuses. There is also an electric oven with a grill and hot plate, the maximum capacity being 3 kW. at 65 volts for the oven and 2.5 kW. at 65 volts for the combined grill and boiling plate. A Staybrite steel sink is fitted in the kitchen.

A driving seat is placed alongside the engine in a small compartment at each end of the train, and the controls are grouped just in front of it. The Triplex glass windows have an electric windscreen wiper and are fitted with sun visors. A Tomey warning switch is included in the controls to give an indication of the engine circuits, and there is a Teloc speedometer. Other fittings at the ends of the train comprise a 10 in. Tonum headlight with foot swivel control, two marker lamps and a tail lamp, and an electric horn.

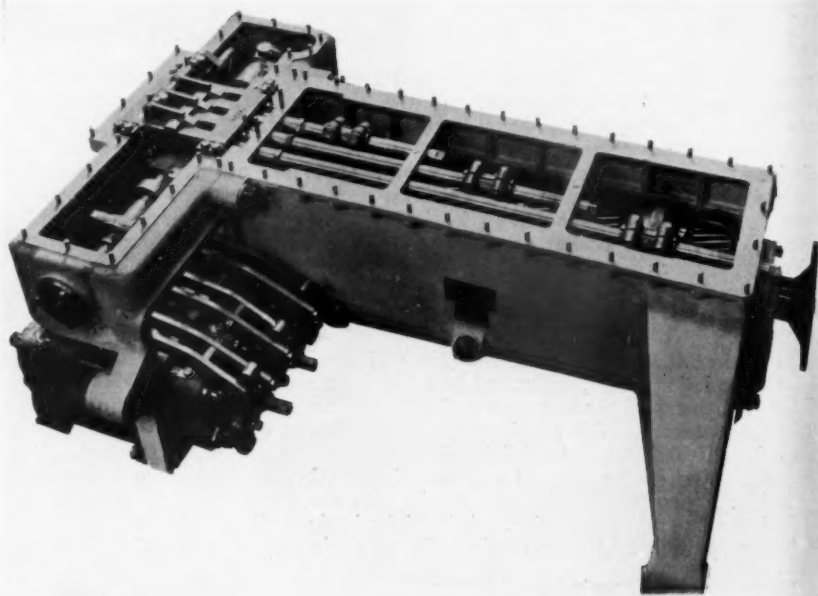
### Procédés Minerva Multi-Speed Gearbox

THE Procédés Minerva pre-synchronising gearbox as used on various French railways, was described in the issue of this Supplement for May 15, 1936, but there is also another type of Procédés Minerva box with servo control and which is easily controlled in multiple-unit. It is installed in railcars operating in France and in the French colonies, and is available with up to eight speeds.

This box (known as the Procédés Minerva type 7000) is of the indirect drive type, and comprises essentially a driven shaft and a driving shaft carrying pairs of constant-mesh pinions to the number of speeds given by the box. All the loose pinions are mounted on needle roller bearings, and are locked on to the shaft as required by means of dog clutches, the operation of which is preceded by positive synchronisation. All the movements of the control rods are effected through pneumatic servo-control, but for the two lowest speeds additional manual control is provided for use in the event of any failure in the air system. For each pair of speeds (1st and 2nd, 3rd and 4th, 5th and 6th in a six-speed box) synchronisation and locking is carried out by a fork and control rod, each of which has two working positions on either side of the centre. The rods are actuated by cams working on a locking device which prevents engagement before complete synchronisation is obtained if the cam corresponding to the new

speed is in the midway position, which corresponds to the period of synchronisation. The pneumatic cylinders from which the primary motion is derived are fitted with springs to return the mechanism to the midway position.

Similar locking mechanism is fitted to the reversing gear, so that it is impossible to reverse the drive unless the railcar is at rest. The control rod is not coupled to the reversing shaft direct, but through a helical spring. While the car is running the reversing lever can be moved over without effect, but as soon as the vehicle comes to rest the action of the spring moves the reverse gears. One or several gearboxes may be operated by means of a mechanically-controlled air distributing system, or, alternatively, by means of electro-pneumatic valves.



Procédés Minerva six-speed type 7000 gearbox

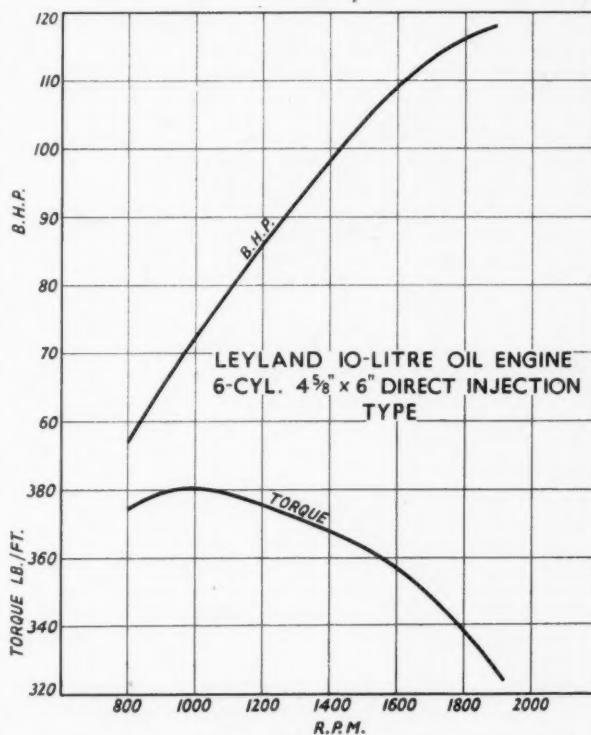


## THE LEYLAND RAILCAR OIL ENGINE

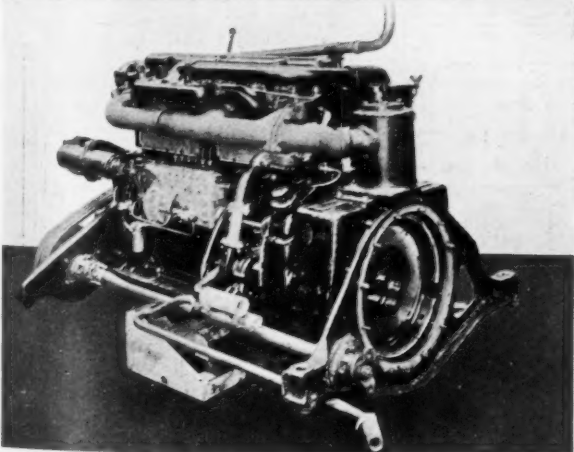
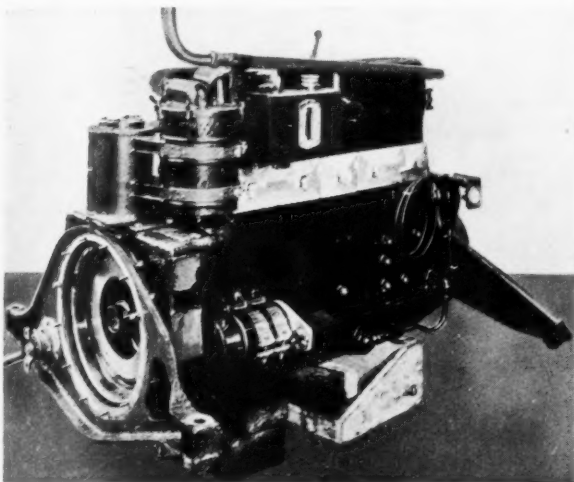
*Three models now in use*

ONE of the earliest road transport diesels to be applied to rail traction in Britain was the Leyland, and the first model to be so used was the 10-litre engine with a maximum capacity of 130 b.h.p. at 2,000 r.p.m. Experience in service naturally indicated a number of improvements to suit the engine to purely railway requirements, principal of which was the substitution of a cast-iron crankcase for the original light metal structure, and the injection arrangements have been brought into line with Leyland's present day practice. This engine is still applied to traction work, e.g., the New Zealand double-engined railcars described in the issue of this Supplement for September 2, but the smaller six-cylinder 8½-litre engine developing 95 b.h.p. at 1,900 r.p.m. has also been used (in the L.M.S.R. four-wheeled railcars), and there is a new six-cylinder engine of approximately the same volumetric capacity which develops a maximum of 125 b.h.p. at 2,200 r.p.m. It is six of these engines which are installed in the L.M.S.R. three-car train.

The 10-litre engine has six 4½-in. by 6-in. cylinders, and in general is limited to a speed of 1,900 r.p.m., at which



Power and torque curves of the biggest Leyland railcar engine

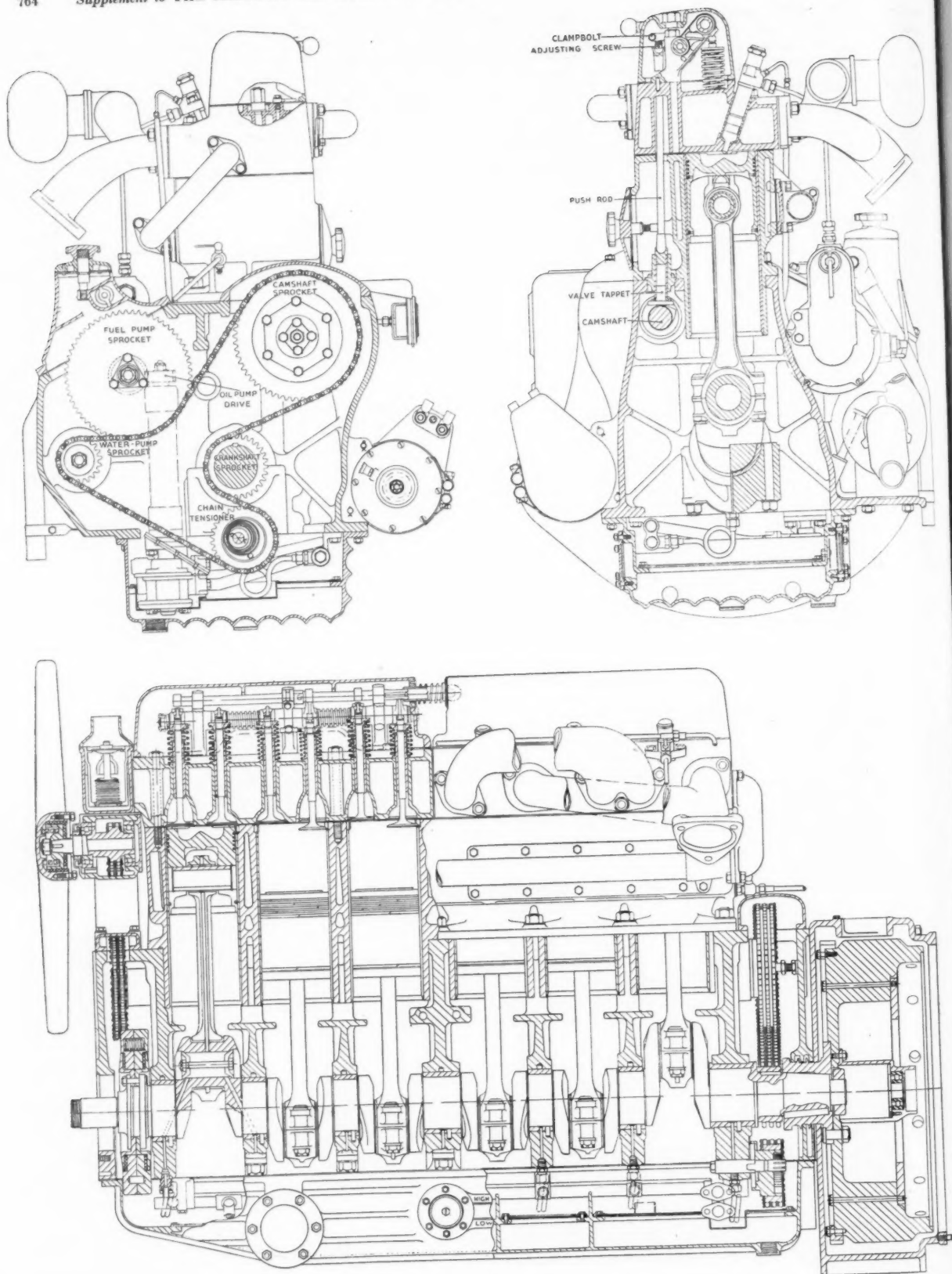


Near side and off side views of the Leyland 10-litre 130-b.h.p. engine

rate the output is 118-120 b.h.p. The cylinder block is a single casting of nickel cast iron. It is of particularly rigid design, and is interesting because of the comparatively small water spaces surrounding the cylinder bores. Cast-iron dry-type liners are inserted in the barrels, and are cut away in two places at the top to clear the large diameter inlet and exhaust valves. The cylinder heads are grouped in two castings, each comprising three heads; an improved arrangement of holding-down studs has been adopted, and an exceptionally good circulation of cooling water is permitted by the design.

In addition to the two valves, the head of each cylinder contains a central atomiser located at an angle. The injection is direct, from a C.A.V.-Bosch fuel pump, and from the four-hole atomiser nozzle the fuel is directed into a dishing of the piston crown, which has a raised point in the centre of the cavity; this central raised portion assists in promoting air swirl. The cylinder head also contains a stellited steel valve face screwed in.

The crankcase is a single iron casting, strongly ribbed to carry the main bearing loads without deflection, and extending well below the crankshaft centre line. The main bearing caps are steel stampings and are dowelled and held by bolts which pass upwards through the base of the cylinder block and thus relieve the crankcase of tension loading arising from the cylinder forces. The seven main bearings themselves are of lead-bronze and have a journal diameter of 3½ in.; end location and thrust are taken by the central bearing and by that bearing nearest the flywheel, both of which are longer than the



Sectional and end views of the Leyland 10-litre 130-b.h.p. engine with  $4\frac{1}{2}$ -in. by 6-in. cylinders

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standard. The single-piece crankshaft is of high-tensile nickel-chrome steel with casehardened wearing surfaces. The crankpins are of 3 in. diameter and are hollow-bored, but the shaft is solid. A frictional vibration damper is fitted at the end remote from the flywheel, but in order to assist in giving smooth running throughout the speed range, the timing chain is mounted adjacent to the flywheel, where it is protected from any possible crankshaft whip. Below the crankcase is a light sump with a bottom plate of corrugated formation, and with detachable covers on each side.

Heat-treated aluminium alloy pistons are used, and the metal is of a type which gives ample strength at high temperatures. One scraper and four pressure rings are fitted. The fully-floating tubular gudgeon pin,  $1\frac{1}{8}$  in. in diameter, is retained in the piston bosses by steel circlips. The small end of the I-section connecting rod is a bronze bushing, and the big-ends have lead-bronze bearings. A hole is drilled up the web of the connecting rod to provide a passage for the gudgeon pin lubricating oil which is supplied by the pressure system *via* the main and big-end bearings.

Driven by a triple roller chain, the camshaft is located in the upper portion of the crankcase. The push rods have adjustable ball ends top and bottom, and the bottom ends can be given attention through inspection doors in the corresponding side of the cylinder block. Heat-treated nickel steel is used for the inlet valves and a special heat-resisting steel for the exhaust valves. The cylinder head covers are secured by hand screws, and their removal enables the valve gear to be checked for clearances, and a lever-operated shaft is fitted to enable the exhaust valves to be lifted slightly when adjustments are being made.

Included in the triple roller chain drive system, which operates the camshaft, fuel pump, and cooling water pump, is a special sprocket to enable the timing to be set to any desired position without removing the driving chain, and there is also an eccentrically-mounted chain-tensioning sprocket.

#### Lubrication

Forced lubrication is provided by a two-stage pump. The first stage draws oil from above a gauze strainer situated in the sump and circulates it through oil-cooling radiators, whence it is returned to the sump through a closed circuit. The gauze filters are easily removable for cleaning, and a non-return valve is fitted in the radiator circuit to prevent the radiators from syphon-emptying when the engine is not running. The second stage draws cooled oil from below the gauze strainer and forces it to the main and big-end bearings (through holes drilled in the crankshaft), and to the rocker gear and timing chain; the cylinder walls and camshaft are splash lubricated. An oil filler is arranged on one side of the crankcase.

The water pump is driven from the timing chain by flexible couplings, and is of the self-adjusting type with spring-loaded carbon gland. The water is circulated from the radiator to the rear of the cylinder heads, whence it flows through large channels round the valve pockets; the cooling of the cylinder walls is by a thermo-syphon action.

Among the remaining equipment is a governor, which forms a single unit with the fuel pump and is free from all external control gear; it permits an idling speed of 400 r.p.m. and a maximum speed of 1,800 r.p.m. There is also a 24-volt C.A.V.-Bosch starting motor, and, when the installation requires it, the radiator fan is driven by a triple roller chain at the end remote from the flywheel.

#### The Braking of High-Speed Trains—(continued)

the wheel sets will not be retarded at the same rate, and will promote jerky and uncomfortable stops with a deleterious effect on the train as a whole, even if the brake gear is designed to give shoe pressures in proportion to the weights on the individual wheel assemblies. In certain examples, particularly where the power car is separate from the passenger-carrying portion, the concentration of weight makes it impossible to brake the most heavily loaded wheels to a degree adequate for speeds of 100 m.p.h., and it may be necessary to somewhat over-brake the remaining wheels to give the requisite retardation. Electric control of air brakes is essential, in order that the pressure may be built up immediately, for a delay of only one second means an addition of 146 ft. to a stop from 100 m.p.h.

**BELGIAN RAILCAR WORKING.**—According to the latest figures, the three Maybach-engined diesel-mechanical railcars set to work on the Belgian National Railways have operated well over 1,500,000 miles at an operating cost, including repairs but excluding interest charges, of 2.5 Belgian francs per km. The corresponding costs of the 14 similar cars built in Belgium in 1933 is 2.1 Belgian francs per km. Steam locomotives working on similar services take 3.5 to 5.0 francs per km. The newer and bigger two-car and three-car diesel trains operate on express services at a cost of 5.4 to 6.1 francs per km., excluding financial charges.

**NORTH WESTERN OF INDIA RAILCARS.**—The 11 diesel-mechanical railcars being built by Ganz for the 5 ft. 6 in. gauge lines of the North Western Railway of India are to have a seating capacity of 101 in one class. Each car will have a six-cylinder Ganz engine set to give 250 b.h.p.

at 1,250 r.p.m. and a five-speed Ganz gearbox. The fully-laden weight will be about 42 tons and the top speed 55 m.p.h.

**DIESELS FOR WEST AFRICA.**—The French Ministry for the Colonies is now considering tenders for the supply of three diesel-electric locomotives and spare parts for the metre-gauge Ch. de fer Dakar au Niger.

**GANZ RAILCARS.**—At the present time there are over 500 Ganz diesel engines in actual service in railcars and railcar-trains. The mileage already made by these vehicles approaches 50,000,000, and the aggregate daily mileage is in excess of 45,000.

**DIESEL ENGINE EXHAUST.**—Tests on a Cummins high-speed oil engine showed that over the normal operating range the CO content of the exhaust did not exceed 0.03 per cent.; no methane content was noted until the engine was working well above its rating.

**ANOTHER AMERICAN DIESEL EXPRESS.**—The winter passenger express service named the Orange Blossom Special, which begins running on the Seaboard Air Line in December, between Washington and the south, is to be hauled by some of the nine 1,800-b.h.p. Winton-engined diesel-electric locomotives, the order for which was noted in the September 2 issue of this Supplement.

**DOUBLE-DECKER RAILCAR.**—The French National Railways is considering the purchase of a double-decker diesel-electric railcar for suburban service, which would have seating accommodation for 125 passengers and standing room for 175. Two Alsthom-Ganz diesel engines, each with a maximum output of 300 b.h.p., are included in the design. The car proposed would have an overall length of 91½ ft. and would run on 12 wheels; the proposed height is 13 ft. 1½ in., and the greatest body width 9 ft. 8 in.



## NOTES AND NEWS

**Leyland Board.**—Mr. A. A. Liardet and Mr. H. Spurrier, Jr., have been appointed to the board of directors of Leyland Motors Limited. Mr. Liardet has been general manager of the company since 1923, and Mr. Spurrier, Jr., has been assistant general manager since 1928; both gentlemen will retain their executive posts.

**Indo-China Railcars.**—Three more Decauville diesel-mechanical railcars of the type described in the issue of this Supplement for July 10, 1936, are to be set to work on the Yunnan Railway next year. They are to be used in conjunction with trailers on fast inter-urban service between Hanoi and Haiphong, and will have a top speed of 68 m.p.h. The five Decauville cars now at work covered an aggregate distance of 403,664 km. during 1937.

**French 500 and 600-B.H.P. Railcars.**—Five of an order for ten Renault 500-b.h.p. diesel-mechanical railcars powered by one 16-cylinder engine have been delivered to the French National Railways and are shedded at Bordeaux. They are to be transferred to Aurillac as soon as the depot at that town is completed. An order for 17 Renault 600-b.h.p. cars is in course of delivery, and most of these will also go to the old P.O.-Midi system, now the Region du Sud-Ouest. In these railcars two 300-b.h.p. 12-cylinder engines are installed. The cars have 64 seats and weigh 45 tons.

**More American Diesel Trains.**—The Southern Railroad has ordered, subject to the approval of the Interstate Commerce Commission, four diesel-electric passenger trains, consisting of two units each, comprising an 80-ft. steel diesel-electric combined mail, baggage, and power car, and a 63-ft. 10-in. steel air-conditioned passenger coach. These trains will be built by the St. Louis Car Company, and the engines supplying the power will be constructed by Fairbanks, Morse & Co. The Alabama Great Southern has also ordered two trains of identical specification from the same builder.

**Express Railcar Service in Yugoslavia.**—On September 1 a temporary public railcar service was inaugurated on the Belgrade-Zagreb line in Yugoslavia. It was an experiment for a month, organised on the occasion of the fairs taking place in both these towns. The Italian State Railways, in order to lend support to the enterprise, lent six railcars, which were operated by Italian personnel. The distance from Belgrade to Zagreb is about 265 miles and the railcars covered it in 4½ hr. with three stops on the way, at Vinkovci, Slavonski Brod, and Nova. The normal time for the journey was thus cut by 3 hr.; the commercial speed was 62 m.p.h., and on some sections a maximum speed of 135 km.p.h. (84 m.p.h.) was reached.

**Swiss Shunting Locomotive.**—The Ciba chemical works at Basle has just put into service a second diesel shunting locomotive, as illustrated on this page. Built by the Swiss Locomotive & Machine Works, the locomotive is powered by a Saurer BLD type engine, which normally gives 100 b.h.p. as a service maximum, but which in this installation is limited to 80 b.h.p. at 1,500 r.p.m. The gearbox is of the SLM-Winterthur oil-operated pattern with three speeds giving track speeds of 3, 5½, and 11 m.p.h. at top engine revolutions; the weight, including 6 tons of concrete ballast, is 17½ tons, and the tractive effort on the lowest gear step is 4 tons. A special form of combined suspension for the underframe and body is incorporated; at the front the axlebox laminated springs are arranged to carry the load of both the chassis and the body, and

at the rear the weight of the adjacent portion of the body is supported by an extra set of laminated springs.

**All-Diesel Operation for American Line.**—The Texas Mexican Railway, a small line with 162 miles of track running from the centre of the Rio Grande bridge to Corpus Christi, Texas, may become the first fully dieselised line in the United States. At present it has 16 steam locomotives, but plans to buy seven 660-b.h.p. diesel-electric locomotives from the Baldwin Locomotive Works, and these units will be suitable for both main line and switching service. The railway officials expect them to do virtually all the work, completely replacing steam power. The line's rolling stock consists of 10 passenger cars, 79 goods vans, and 29 service cars. The Texas Mexican was formerly



80-b.h.p. Swiss diesel shunting locomotive with three-speed oil-operated mechanical transmission

controlled by the National Railways of Mexico, but passed to American interests early this year, and has applied to the Interstate Commerce Commission for approval of a plan to issue \$200,000 of equipment trust certificates to the Reconstruction Finance Corporation to finance in part the diesel locomotive purchase.

**A New Burlington Zephyr.**—The Chicago, Burlington & Quincy Railroad has ordered from the E. G. Budd Manufacturing Company a new four-car streamlined stainless steel diesel-electric train for operation between Kansas City and St. Louis, making the ninth Zephyr train in the Burlington fleet. The new train will be 333 ft. long, and the forward car will contain the power plant and space for baggage and mails. The second car will contain 72 seats, the third car lounges for men and women and 52 ordinary passenger seats, and the fourth car a kitchen, dining accommodation for 24 passengers, and an observation-lounge with 22 seats. The engine is to be a modified Winton model with 12 cylinders 8½ in. by 10 in. and developing 1,000 b.h.p., in place of the 900 b.h.p. from a dozen 8-in. by 10-in. cylinders in the previous models. Disc type brakes are to be incorporated instead of shoes on the tyres, and this feature is exactly opposite to European practice, in which there is a tendency to return from disc and drum brakes to the more conventional type with cast-iron blocks on the wheel rims. The present fleet of eight Burlington Zephyr trains has now covered about 6,000,000 miles. The Burlington line has also ordered two additional sleeping cars for use with the existing 3,600-b.h.p. Denver Zephyr trains.